ENGINEERING NEWS-RECORD

A McGRAW HILL PUBLICATION

Another "Underwater Bridge" for Electrical Lines Uses

BYERS WROUGHT IRON

Safe conduct for vital power and communication lines at the new Unionport bridge, Buckner Boulevard, Bronx, New York, is provided by an interesting conduit system of Byers Wrought Iron pipe.

Eight U-shaped conduits, each made up from 5-in. extra heavy galvanized Byers Wrought Iron conduit, welded together in specially designed, close-tolerance coupling sleeves, form the assembly. Reinforced with a 4-ton spreader, the giant "U," 75-ft. wide and 40-ft. high, was lifted by derrick barge and lowered into position in a 2-ft. clearance space between the old bridge piers and the new coffer dams. The bottom run is located 5-ft. under the bottom of salty Winchester creek, shielding the power and telephone cables from breakage by dragging anchors — previously a frequent occurrence. The brackish water creates a serious corrosive condition, which dictated the selection of wrought iron. The work was done under the direction of Hon. Frederick H. Zurmuhlen, Commissioner of the Dept. of Public Works, New York City. Contractors were Peter V. Connolly Co. and Semor & Palmer, Inc.

There is plenty of engineering precedent to support the choice of wrought iron for this demanding service. Over 3 miles of 3½-inch black wrought iron pipe, assembled with threaded couplings which were fillet welded to reinforce and seal the joints, were used in a crossing of the Calumet River near Chicago. The conduit was filled with light mineral oil, to prevent condensation and to signal any leaks. An inspection after 13 years of service found the installation still functioning perfectly. No loss of oil had occured. Several similar installations have been made in various sections.

Wrought iron intended for conduit use should be so specified, as the threading is different from that used on pipe, and extra care is taken to avoid rough spots that might interfere with pulling of the cable. The high degree of corrosion resistance comes from the unique structure and composition of the material. Tiny fibers of glass-like silicate slag, threaded through the body of high-purity iron, halt

and disperse corrosive attack, and so discourage pitting. The fibers also anchor the initial protective scale, which shields the underlying metal.

Several Wrought Iron Cable Conduit jobs, both under-water and underground, are described in our bulletin WROUGHT IRON FOR UNDERGROUND SERVICES. A copy will be sent to you on request.

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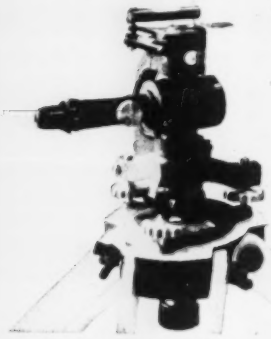

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ENGINEERING NEWS-RECORD

Volume 144 MAY 11, 1950 No. 19

WALDO G. BOWMAN
Editor

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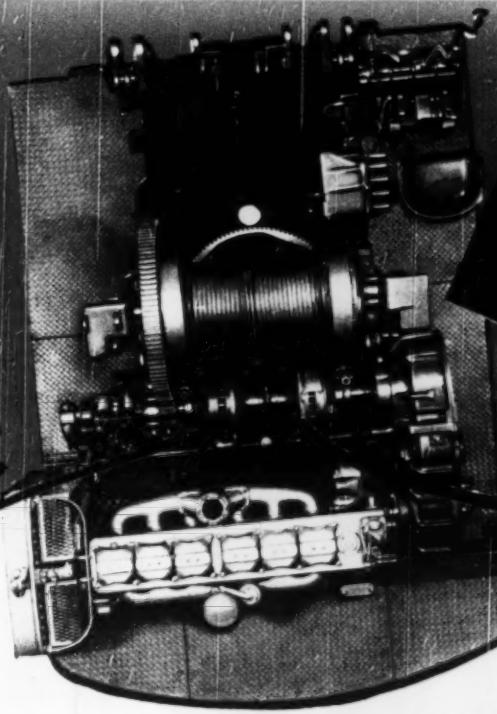

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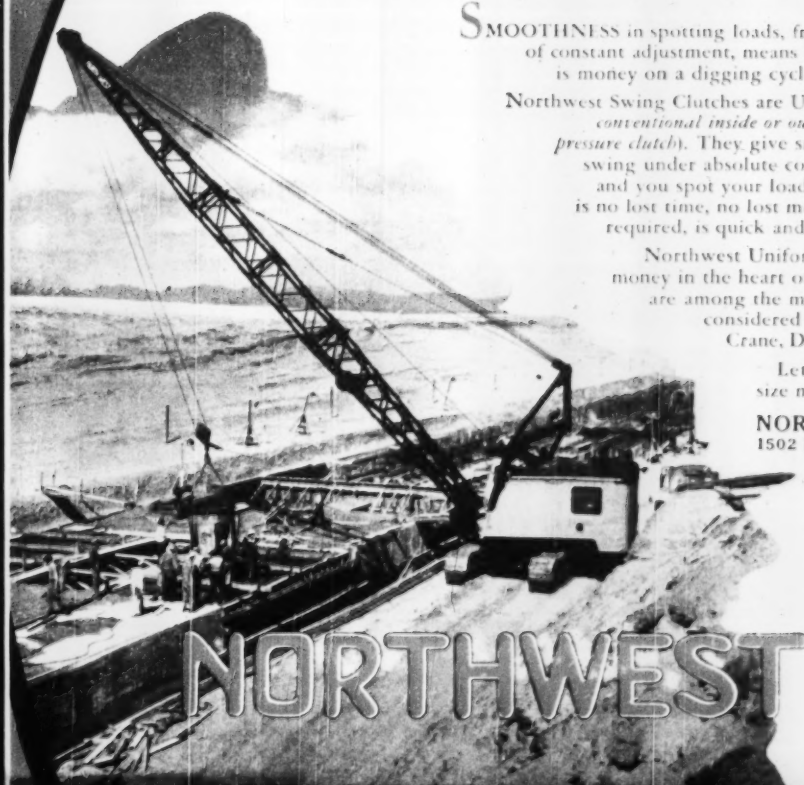
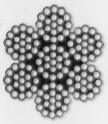


Whatever the job

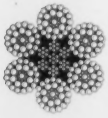
6x7 rope is made with 7 wires in each of 6 strands around a fiber core or a steel core. It may be bright or galvanized steel, stainless steel or monel metal. Uses are for haulage, guying, sand lines, core barrel lines, rigging, controls, etc.



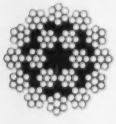
7x19 is made with 7 strands of 19 wires each, one strand forms the core. It is widely used for corrosion-resisting wire rope of galvanized steel, stainless steel and monel metal. Widely used for aircraft controls and for miscellaneous hoisting and controls.

6x19 classification is made with wire combinations varying from 16 to 26 wires in each of 6 strands. Supplied *PRE*formed or non-*PRE*formed, Lang Lay or Regular Lay, with fiber core, or steel core in bright and galvanized steel, stainless steel and monel metal. It is one of the most widely used ropes for general hoisting, cranes, excavating equipment, haulage, mining, logging and rotary drilling. Illustrated is a cross-section of 6x19 filler with I.W.R.C.

select the right wire rope for your equipment from



6x37 group has various types with wire combinations ranging from 26 to 46 wires in each of 6 strands. Supplied *PRE*formed or non-*PRE*formed, Lang Lay or Regular Lay, with fiber core or steel core. It is extremely flexible and has many uses for hoists, ladle cranes, coal cutting machines, winches, dredges, excavating equipment, etc. Illustrated is a cross-section of 6x41 I.W.R.C.



18x7 is made as illustrated with 18 strands of 7 wires each and supplied *PRE*formed. It is a non-rotating "Kilindo" rope made by combining two opposing lays of rope. Its principal use is for hoisting with a single line to overcome rotating or spinning of the load. It is desirable for small shop and warehouse electric hoists, and for sewer, subway and mine shaft work.

8x19 is an extra flexible rope made in various wire combinations. It is used in iron and special traction grades for passenger and freight elevator service, and in Monarch Whyte Strand Improved Plow Steel for many and varied purposes where the rope is not subjected to heavy crushing loads. Illustrated is 8x19 Seale Special Traction Elevator Rope.

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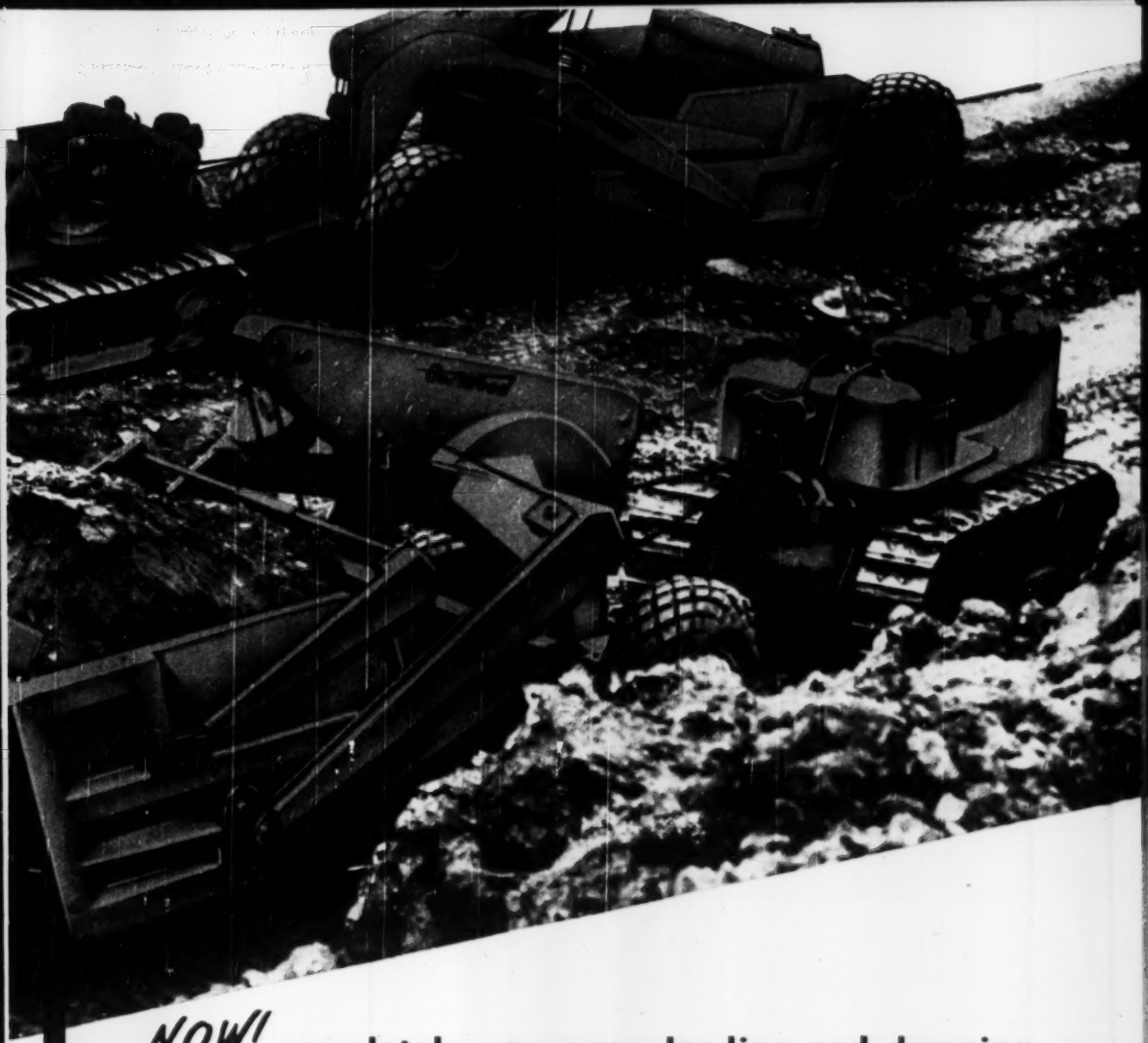

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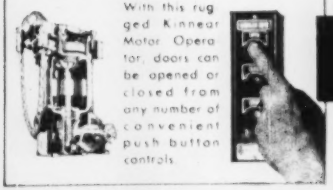

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NEWS BRIEFS

Who'd Live There?—New Jersey's Governor Driscoll says the state plans to help build a "television city" on the marshes near Hackensack, about five miles from New York City. The idea is for the state to acquire the site, put in roads and parking sites, then leave the remainder of the job to private enterprise. The center would combine complete facilities for television programming and transmitting. TV industry leaders suggested it.

Army Orders—Boston must start a $3,000,000 suspension bridge between Chelsea and East Boston by July 1 to comply with War Department orders, according to Mayor J. B. Hynes. It's to replace the existing Meridian Street bridge which the Army ordered out more than a year ago.

No Mud Problem, Anyway—Virginia highway engineers say the bridge problem has replaced the "mud problem," and they estimate it'll take $50,000,000 to solve it. The state has 6,822 bridges of 20 feet or longer.

Problem Solved—Dallas, Tex., city council got action when it warned home builders to do something within 90 days about the negro housing shortage or face city action toward more public housing. Builders promised to build 5,000 homes for negroes. Forty members of the Dallas Home Builders Association signed an agreement to build from 20 to 100 homes apiece.

High Gear—North Carolina's Highway Commission had 152 rural road jobs under contract at mid-April, but didn't expect the $200 million program to reach its peak until mid-summer. Prices have been good and competition sharp. More than $41,000,000 of the first $50,000,000 of rural road bond money has been allocated.

Business Backlog—New York State is committed to a $146 million town highway improvement program to start in 1952 and run for 10 years. The state will pay half. Its object: to bring town highways up to date for safer, faster farm to market transport.

Just Don't Land—That helicopter which Chicago uses to collect Lake Michigan water samples (ENR April 20, p. 25) was temporarily out of action soon after it began operating. Anyway, not the craft as it landed two miles off the 79th Street filtration plant. The tail rotor was damaged so badly that

(Continued on page 11)

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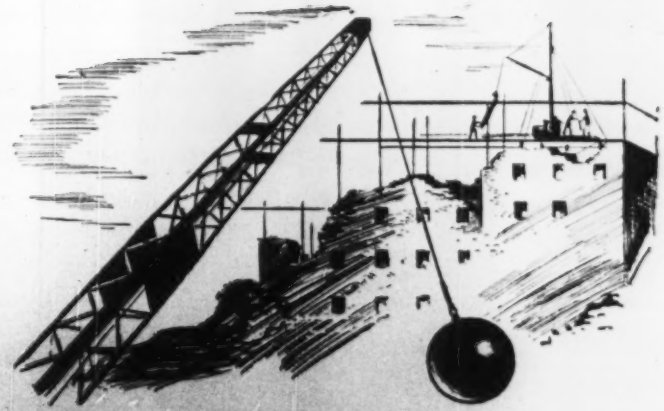

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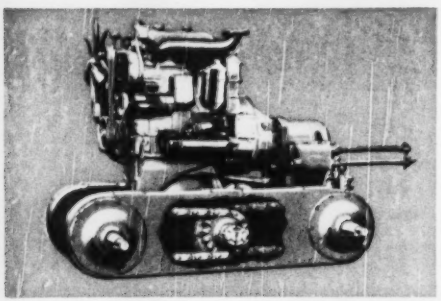

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(Continued from page 8)

a Coast Guard cutter had to tow it in—from four miles out, where it had drifted.

Sooner the Better—The 100-mi. eastern extension of the Pennsylvania Turnpike is expected to be opened Oct. 1. It is well ahead of schedule, and some officials hint it may be finished in time for Labor Day use.

Anti-Flood Front—Massachusetts' Gov. Paul Dever has asked the legislature to ratify two compacts aimed at controlling floods on the Connecticut and Merrimack Rivers. One would cover Massachusetts, New Hampshire, Vermont and Connecticut, the other Massachusetts and New Hampshire. Joint action by the states, he said, would open the way to federal participation, adding power, recreation and irrigation to potential benefits.

Finishing Hospital Job—Veterans Administration will have the largest hospital program in history entering its final stage at the end of the year. All but three of 67 new hospitals will be built or building then, VA says, and plans for 13 of the last 14 hospitals will have been completed.

Why Not Everywhere?—The Maine Turnpike, a Kittery-Portland toll road, has saved almost $1,000,000 in its first two years—if you figure the lives and man-hours saved. Executive Director William B. Getchell points out that only two lives have been lost on the road, adds that if it were subject to the same fatality rate of the alternate free route (Route 1), the toll would have been 14 deaths.

Swords to Plowshares Note—North Carolina Highway Engineer W. H. Rogers is anxious for further data on the use of chemicals to form roadbeds. Both Army and Navy have been experimenting with the problem (ENR March 2, p. 26, March 16, p. 23). North Carolina used tensol-resin successfully before the war, but was troubled by its cost and the necessity for using a different formula for each type of soil.

Boston Shakeup—Public Works Commissioner George G. Hyland, of Boston, has abolished the city's highways division and transferred its executives to other duties. Its employes and those of the bridge and ferry division were merged into a new bridge and highways group. The moves followed an investigation by the city finance commission into allegations of irregularity in street construction. Widespread investigations are continuing.

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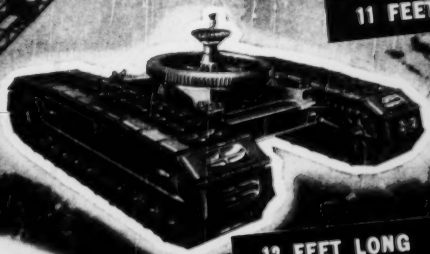
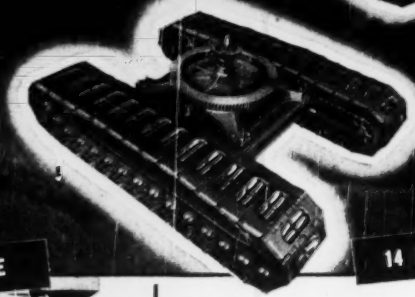


12 FEET LONG



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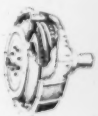

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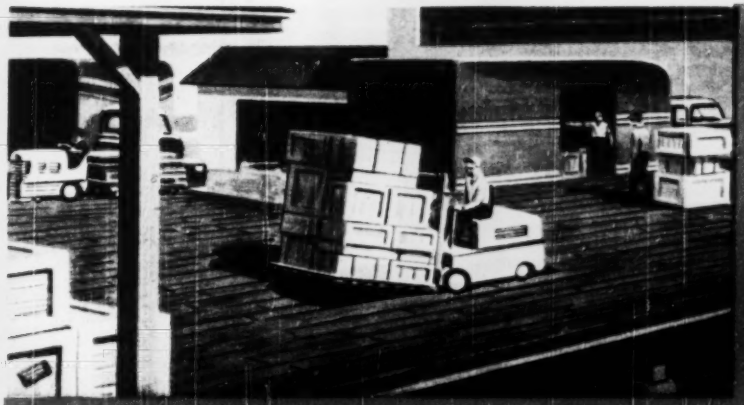

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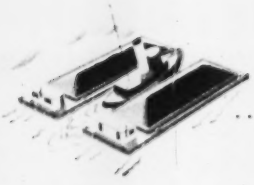
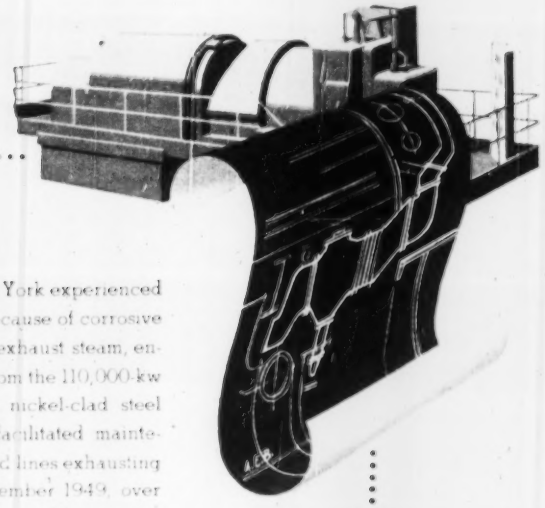
...or how to insure long life in high-temperature exhaust ducts





A Consolidated Edison Company plant in New York experienced costly failures in atmospheric exhaust ducts because of corrosive and erosive action developed in discharging exhaust steam, entrapped gases and chlorinated salt tidewater from the 110,000-kw turbines and auxiliary equipment. In 1946, nickel-clad steel ducts were installed. Their modern design facilitated maintenance by permitting shorter flanges for two feed lines exhausting from the auxiliary lubrication pumps. In December 1949, over three years later, the ducts were found to be in excellent condition, and savings had more than returned original installation costs.

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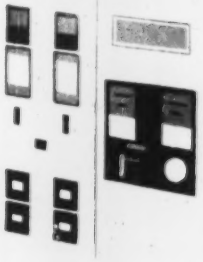

A nickel working surface is so satisfactory for exhaust duct service that Consolidated Edison Company of New York is standardizing on this design. For maximum economy the ducts are fabricated of Lukens Nickel-Clad Steel.

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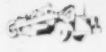

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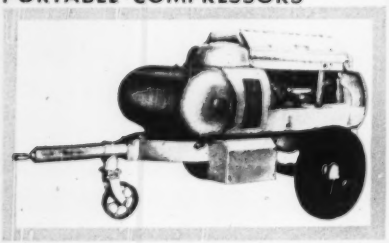

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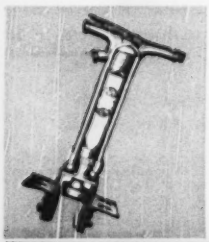
JOY L-47, a hard-hitting medium-weight tool that can drill to 30 feet in hard formation.



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THE CONSTRUCTION WEEK

SEAWAY OFFENSIVE, II—Prospects of favorable action on the long-argued St. Lawrence Seaway (ENR May 4, p 17) zoomed suddenly upward last week under the impetus of a major force that has been lacking—big business. For many years, big business had been discreetly neutral or much opposed, while the Seaway ball was carried by politicians and the perennial advocates of inland waterways. But last week, representatives of all but two of the big steel companies appeared before the House Public Works Committee to push for the project. Reason: The steelmen have heavily backed the exploration of the vast undeveloped ore deposits in Labrador, and want to use their big ore-carrying freighters to bring the ore into the Great Lakes as replacement for the dwindling Mesabi Range ore. With such backing (National, Republic, Wheeling, Youngstown, Armco) observers see the Seaway proposal coming off the Congressional shelf and moving up into the "likely" brackets.

BETTER CLIMATE—In line with the prospects for the St. Lawrence is the opinion that the administration's attitudes toward business is getting a lot friendlier. The big gains in employment, and continuing strength in construction, steel, autos have about persuaded the government that if there is any slide in the fourth quarter, it'll be slight. The change in feeling may keep down the election-year heckling that might come if any recession were in sight.

MORE POWER FROM NIAGARA—The Senate is now considering a request from President Truman for fast action on a new U. S.-Canada treaty that will make possible development of more power from Niagara Falls (without detriment to the falls as a scenic attraction). Most observers think approval will be forthcoming: Chief opponents have been private power interests at the falls, who anticipate that additional water will be assigned to public power development.

GLASS FOR THE GLASSLESS?—That virtually wall-less, actually window-less factory that Corn Products Refining Co. finished at Corpus Christi, Tex., a short while ago (ENR Nov. 24, 1949, p 42) won't be that way long. Rumor is that windows will be installed. Climate is swell, but too windy.

WHAT'S THE LIMIT?—San Joaquin Valley farmers who have carried their fight against the Bureau of Reclamation's actions at Friant Dam in California to a federal district court, got a definition of the issue last week. The 1,100 farmers charged that the Bureau deprived them of their water rights by diverting Friant Dam water into the Kern County canal and watershed, demanded an injunction to halt the diversion. The bureau's attorney's replied (among other things) that the federal government could impound water without condemning property below the dam, and that the farmers had shown no sufficient cause of action. The court denied the injunction without prejudice, to allow the farmers to amend their complaint. In its denial, the court delivered a stinging slap at the bureau. Said Judge P. M. Hall: "If the case were dismissed, it would allow the bureau to divert every stream in the West. The Reclamation Bureau has exceeded its authority . . . by its attempt to take the water rights of the farmers without compensation."

CUT-OFF CUT OFF—Homebuilders who were working up to a full-scale campaign to halt Veterans Administration plans to terminate combination VA-FHA mortgage loans before the official cut-off date of Dec. 31, had their guns spiked last week: VA announced it would chop the loans as of Oct. 20. The 1950 Housing Act authorized the action, if the VA administrator saw fit; homebuilders charged such action would slow home sales to ex-GI's (ENR May 4, p 17). There's no forecast of the effect, but government housing people lean to the belief that the cutoff will cause no slowing in residential construction.

37½-HR WEEK?—The 37½-hour work week may become a future Truman policy, Washington thinks. But it won't be pushed now, so long as the unemployment figure keeps below the 5,000,000-mark. Effect of a cut in working time can be gaged by recent figures of economists, who figure a cut-back to 37½-hours would create 2,000,000 more jobs.

MONEY GOING UP—It will cost you more to borrow money in coming months: Commercial banks are planning to raise their rates on short-term loans. Upward pressure comes from: Business firms, which are currently borrowing at higher-than-normal rates to buy goods they need to keep sales high; insurance companies are selling government bonds to get cash for mortgage lending. And the federal government itself is now borrowing about $100 million in new money every week—by issuing that much more in new 90-day bills than it retires, with Treasury paying increasingly more in rates for this money.

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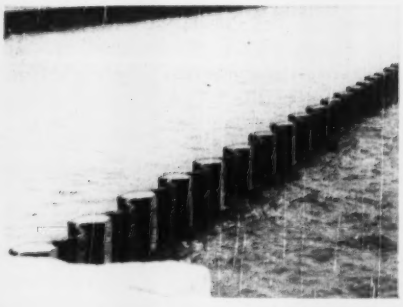

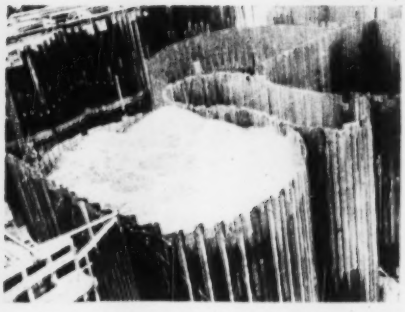

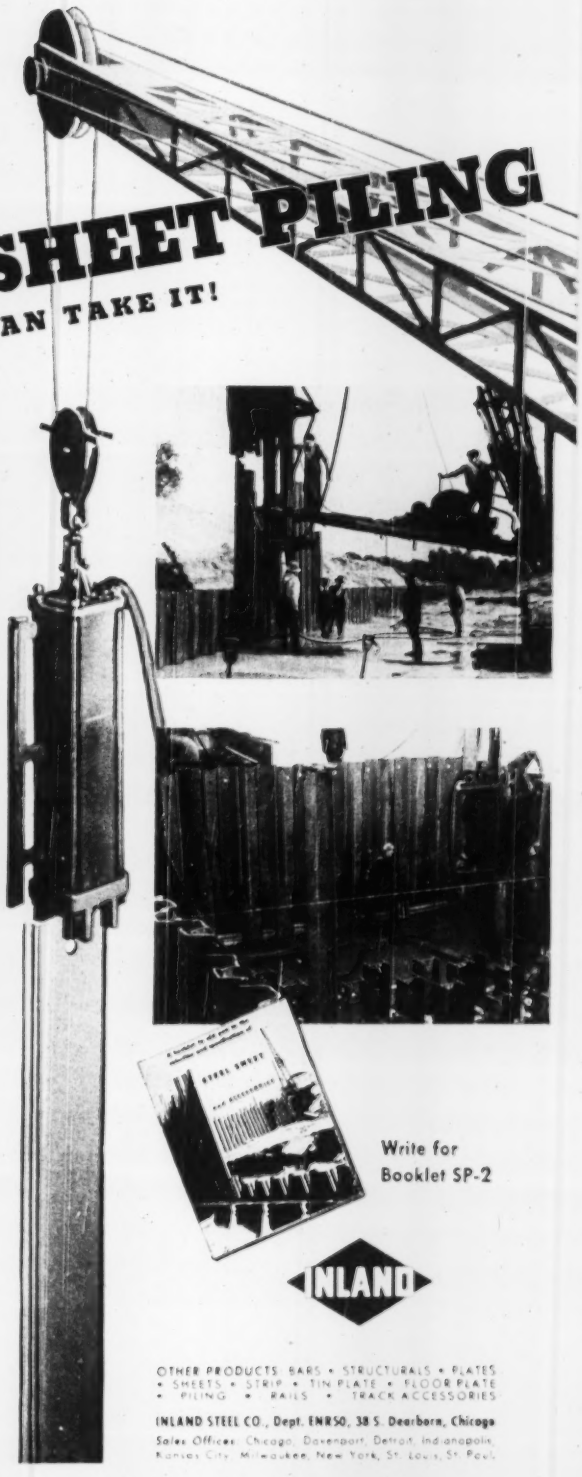

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CONSTRUCTION TRENDS

NEW BUILDINGS PAY OFF

Here is a fresh approach to figuring the cost of a new industrial plant—and one that the construction industry can turn to its advantage.

Outlined in FACTORY MANAGEMENT AND MAINTENANCE, McGraw-Hill's monthly magazine for top industrial management, the idea is to figure the cost of a new plant as part of total manufacturing costs. In short, the idea is to ask: What will a new plant contribute to profits?

In the past, most manufacturers haven't had a yardstick to use in figuring what a new plant would add to their operations, profit-wise. Big companies had, of course, built up some experience of their own that was a useful guide. But most companies—particularly the small ones—simply built a plant when they needed it to expand operations. Generally they haven't considered the possibility of replacing old buildings with new simply because new ones could save money.

FACTORY's approach to the problem, though, shows how a new plant can pay off all along the line—in saving on materials handling costs, supervision, inventories, maintenance and other manufacturing costs.

Here's how savings worked out in eleven companies:

Cost of Plant	Annual Saving	Years to Pay Off	Increase In Output per Manhour
200,000	$8–10,000	25	10%
616,267	50,000	10–15	7%
875,000	50,000	20	10%
900,000	140,000	8	NONE
950,000	X	15	25%
1,300,000	NONE	12	10%
1,500,000	X	X	8%
1,884,732	800,000	8½	30%
2,400,000	250,000	X	X
3,000,000	400,000	10–15	8%
6,000,000	X	10	10%

(X—no answer)

These were postwar plants, built to (1) centralize operations, or (2) to expand capacity, or both. They were not designed primarily to save on operating costs—although the table shows that on the whole they racked up impressive savings.

This table doesn't reveal all the complications involved—and it doesn't show all the benefits. These companies increased their production capacity by from 20% to 300%. That means that their overall costs for things like lighting, heating, and inventories went up in many cases. That complicates FACTORY's report.

It's also difficult to know—although in almost every case companies believed they benefited—what was the pay-off in things like improved worker morale and improvements in quality of product.

In trying to get a simple yardstick, FACTORY showed that the **annual cost** of these plants was, on the average, 6.6% of company payrolls. In another group of plants reported in FACTORY, annual costs averaged 5.1% of payrolls.

Figured that way, the table indicates that almost every one of those plants is paying back its costs year by year from the improvement in output per worker it made possible.

What does all this mean for construction?

This is the first attempt at a yardstick that will give contractors and engineers a powerful sales argument. The big market in industrial building is in replacing old buildings and obsolete buildings with new. New building simply to expand capacity, although it has been the biggest part of the market in past years, will be comparatively small in the future. Currently, according to McGraw-Hill's survey of business plans for investment in new plants and equipment, business is using two-thirds of its funds to replace and modernize old facilities. Only one-third is going to expand capacity.

The possible market is huge, particularly in the eastern part of the United States. New England cities, for example, are filled with old brick and stone factory buildings, many of them built before 1900. They are multi-storied, were not designed to handle materials in the volume that is necessary today, and are not easy to adapt to modern manufacturing.

Many of these old buildings, too, are set in the midst of highly congested areas where movement of freight in and out of the plant is costly.

Since the war, industry's incentive to build new, efficient buildings has increased sharply. Hourly wages in manufacturing are more than double what they were in 1939, while prices are up far less. Increasing competition, too, is putting a premium on efficiency. And more and more manufacturing processes require controlled conditions, for example, regulation of air temperatures or humidity.

To develop the replacement market, engineers and contractors need a yardstick—a way of showing industry how a new building can pay for itself by cutting operating costs.

This is the first time—in anything more than isolated instances—that evidence showing how new buildings can be profitable has been put together.

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Better Pollution Control

WHEN IT COMES to pollution abatement, California is keeping step with her traditions—that of doing big things boldly. Departing sharply from accepted practice, the Water Pollution Control Board has decided that abatement requirements are to be based on the use to which the water under treatment is to be put, instead of on some arbitrarily fixed requirements. The state has been divided into regions, generally on a watershed basis, with standards in each region to be set by a local board familiar with local needs.

Members of the board state frankly that the program is experimental. Hence the board will welcome comment from anyone whose experience may be helpful to it in developing a control system that will attain the boards objectives and still be equitable.

The board deserves encouragement in what it has undertaken to do. Pollution control requirements that are set on a statewide or regional basis tend to be too high. Too frequently they have been prescribed by persons to whom pollution control means elimination of all pollution. As a result, industries and sometimes whole communities can be required to make costly investments to produce a cleaner effluent from their treatment plant than is required by the condition or use of the stream into which it flows. That is an economic waste. Such unnecessarily high requirements also check progress and make it difficult to get cooperation in effecting the control program. The California plan is designed to avoid such difficulties.

Chuck-Holes and Pavement Striping

THE ACCUMULATED wintertime urge for accelerated driving by the average motorist—both in speed of driving and distance traveled—is suddenly apparent with the advent of spring weather and open roads. To protect these drivers, maintenance engineers are actively engaged in repairing the ubiquitous "chuck hole"—one of the deadliest of hazards to the high-speed motorist. In many states this problem appears to be more serious than usual this year, yet there is ample evidence of extraordinary efforts to eliminate that danger quickly.

Unfortunately, there is less evidence of similar activity in expediting the painting or repainting of center lines and no-passing lines. This apparent apathy on the part of some states, counties or city administrations is serious. It probably is in part responsible for the increased number of early spring accidents on highways.

Pavement stripers admittedly are an expensive item in any equipment inventory, but there is little excuse for not operating them each daylight hour, weather permitting, or even around the clock if properly lighted.

All signs point to greater traffic density on our highways this summer. If a continued sharp rise in the accident rate is to be avoided, all maintenance operations such as filling holes and renewing the lane markings should be completed as soon as possible.

How Much Road Work?

ESTIMATES of the amount of road work needed to make our highways adequate for today's traffic have risen in the past year or so to staggering figures. Most recent estimate is that of the Congressional joint Committee on the Economic Report, which set the total at $41 billion.

That our highways in many places are inadequate for current traffic is evident to anyone who travels around the country in a motor car, yet it does not seem probable that they can be as hopelessly obsolete or broken down as that figure would indicate. Pavements are poor in many places and aggravating delays are encountered in and around most cities due to traffic congestion. But on the other hand one can drive mile on end at high speeds with safety and reasonable comfort in many regions, even through some densely populated areas. Where then can explanation be found for this great difference between observed conditions and estimates of highway needs?

Considerable light was cast on that question by C. H. Buckius, assistant chief engineer of the Pennsylvania Highway Department, at the Highway Transportation Congress in Washington in April. He said it was a case of planning to buy a $100 suit when you can only afford a $60 one.

Citing the estimate of the Bureau of Public Roads that it would require $11 billion to bring the Interstate Highway System up to minimum standard set for that system, Mr. Buckius said that Pennsylvania would have to spend $927 million if it built the 1,026 miles of the systems within its borders to those standards. But meeting those standards, he said, frequently would mean building four lanes where current traffic could be handled adequately by a two-lane road. To meet "practical and tolerable standards", on the other hand, would only require the expenditure of $270 million on 594 miles.

If the type of thinking that has been applied to Pennsylvania's highway requirements could be applied in each state, Congress and the Bureau of Public Roads would have a much more accurate picture than they now have of actual road need on which to base a logical road-building program for the years immediately ahead. Meeting the most urgent needs is the task for today and we should have some measure of its magnitude. Refinement—the $100 suit—can come later.

Ten Years Ago...

this test paving was laid in Minneapolis—the first commercial use of Atlas Duraplastic air-entraining cement. Badly scaled background section was made with regular cement. Foreground concrete was laid at the same time with Duraplastic. Here are both sections, photographed ten years later, after ten severe winters, heavy applications of de-icing salts and many freezing-thawing cycles—convincing proof of Duraplastic concrete's lasting durability. Longitudinal structural crack shows some raveling. Note perfect transverse joint.

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ENGINEERING NEWS-RECORD

MAY 11, 1950 VOL. 144 NO. 19

Sewerage works upswing may set new dollar record

Indexes show continuing gain over 1949 record year as housing boom, clean-stream drives keep up pressure for added and improved sewerage facilities

The 1950 construction boom—which saw a new record established last month in housing starts—may see another new record set this year in sewerage contracts.

Certainly, the factors necessary to achieve a volume exceeding last year's $277 million record are present.

1. The money market is in highly favorable shape for municipal financing, whether by general obligation or revenue bonds.

2. Considerable pressure is being exerted upon municipalities by various governmental agencies above the municipal level.

3. The backlog of proposed sewerage construction is growing.

For four months of 1950, contracts are one percent ahead of the comparable period last year, a record.

The prospective record comes on top of the vast sewerage program that has gone forward since the end of World War II. There have been sewerage contracts let since 1945 amounting to $800 million. Despite that kind of activity, U. S. Public Health Service officials say pollution is growing worse, rather than better.

Of itself, the continuing frenzied housing boom would create considerable demand for new sewerage works. On the basis of continued large-scale housing construction for several years to come, prospects for sewerage business look good.

• **Plenty of money**—Depending on the credit of the issuing municipality, there's plenty of money around and it's rarely been cheaper. A week ago, the Dow Jones municipal bond yield average stood at 2.41 percent. At the same time, the Dow Jones municipal revenue bond average stood at 2.44 percent. Such yields to investors indicate low interest costs to sellers. Thus, a new sewerage volume record shouldn't be difficult to achieve, so far as the financing costs are concerned.

These yields will vary with the Federal Reserve Board's management of the money market, of course. And FRB tends to raise money rates as inflationary dangers increase, let rates sag as deflationary forces take over. Thus, the likelihood of any real inflationary tendencies as the year goes by—or the reaction from them—could affect sewerage financing costs and, in turn, the 1950 volume.

Right now, though, the market for municipal securities is booming. Bond houses, which had been well loaded with such securities, had cut the supply down to $135 million last week. That's high, but a substantial drop from a week earlier. And within the next 30 days, issues totalling almost $250 million will have come to market.

• **Pressure, too**—Throughout the U. S., municipalities are under pressure by states and federal agencies to do something about stream pollution arising from the disposal of untreated sewage in public waterways. One of the most drastic of these campaigns so far is in full swing in Pennsylvania. There, industrial polluters and cities alike are under closed-end orders to build treatment facilities. More than 45 percent of the municipalities subject to Pennsylvania's Clean Stream Law are under such orders at the present time (ENR March 2, p 29).

Varying degrees of pressure are being exerted in other states, particularly where interstate compacts to abate stream pollution are operating. One of these is the Ohio River Valley Water Sanitation Commission, headquartered in Cincinnati and attempting to purify one of the most heavily industrialized—and populated—streams in the land.

Similar agencies are operating in New England, the New York harbor area, the Delaware Basin, the upper Mississippi River, the Missouri River, the Great Lakes Basin, the Potomac and Red Rivers, the Pacific Northwest and elsewhere.

• **Lots to do**—Right now, there's a $2.2 billion backlog in sewerage construction on the books. So far this year, it's been growing—up $27,000,000 in the first quarter. That's an indicative figure, for the increase in backlog during the comparable period last year was only $2,000,000. And between April and December, 1949, the backlog dropped by $50,000,000, as work went into construction faster than new projects arose.

Regionally, changes in the sewerage

(Continued on page 24)

STRONG ROOF—H. K. Williams Co., a Louisville, Ky., contractor, took this 5-ton roller to the roof of the Brown Garage, Louisville, to help lay an asphalt coating so that a 200-car parking area could be opened there. (Courier-Journal & Times Photo)

Niagara redevelopment poses power problem

Senate gets treaty for ratification—legislation introduced calling for federal redevelopment of power

The long expected question of who will redevelop Niagara Falls power to more than treble present hydroelectric capacity of the scenic site came out in the open last week in Washington.

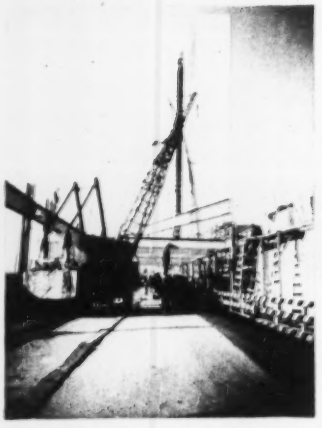
President Truman sent the Senate the treaty signed with Canada earlier this year (ENR March 9, p 20) to reallocate between the two countries the waters of the Niagara River. Urging Senate approval of the Niagara water pact, the President also declared, "I believe that the additional power facilities should be publicly constructed, in order that the benefits of the hydroelectric power produced there can be passed on to the people at the lowest possible cost to them."

On the heels of the Presidential message came a definite proposal for public redevelopment of Niagara Power. New York Democrats, Sen. Herbert H. Lehman and Rep. Franklin D. Roosevelt, Jr., introduced a bill which would have the federal government build the new power installations and sell them to New York state. Construction would be done by the Corps of Engineers. Presumably, the purchase and operation of the new power plants would be handled by the Power Authority of the State of New York, established some years ago to operate the still unapproved St. Lawrence River power plants.

• **Present licensee ignored**. Left out in the cold under the Lehman-Roosevelt plan is the Niagara Falls Power Co., which now operates two power plants at the Falls with a total capacity of some 440,000 kw. The company, a subsidiary of the Niagara Mohawk Power Corp., is expected to apply to the Federal Power Commission for a license to build the new facilities when the treaty is ratified. Passage of the new bill would cut out the company from redevelopment. It also would have future implications for the company because the 50-year FPC licence for private development at the Falls does not expire until March, 1971.

One objection to state operation of the facilities is anticipated in the bill. Portions of Pennsylvania and Ohio located relatively close to the Falls would be granted some of the new power. Final word, in case of disagreements over interstate power allocation, would be given FPC.

Congress will not approve the Lehman-Roosevelt bill now, but this plan for federal-state redevelopment will be pressed next year. It is likely to be ratified this year by the Senate.



MORE UN FACELIFTING—A roof is being erected over Franklin D. Roosevelt Drive, along New York City's East River from 42nd to 48th Streets, site of the United Nations development. The UN building is in the background. At right is part of the framework of the UN Meeting Halls building. The latter will be cantilevered over the drive to the river's edge. American Bridge Co. is the contractor.

Predict, deny salt flood in California valleys

Evan T. Hewes, president of the Imperial Irrigation District, has issued a point by point refutation of a contention that southern California's Imperial and Coachella Valleys are in danger of being flooded by sea water from the Gulf of California.

Writing in "Harper's," Alfred M. Cooper, former industrial training consultant for the Los Angeles Water Department, contended that the silt barrier deposited by the Colorado River between the gulf and below sea-level Imperial Valley is being eroded away by tidal bores. Cooper maintained that the barrier has dropped from 28 to 15 ft above sea level. He described it as 50 mi thick, previously, but said most of the surface was now covered by a salt water lagoon.

Hewes, whose statements were endorsed by Joseph E. Friedkin, resident San Diego engineer of the U. S. Section of the International Boundary and Water Commission, said:

"The low point of the barrier is 40 ft high. The distance from sea level at the river mouth to the international boundary at Calexico is 60 mi. There has been no change in this condition in the last 75 years."

Hewes denied that any seepage is possible as contended by Cooper. Hewes said the barrier is composed of finely granulated silt and clays which make it impervious.

Sewerage record possible

(*Continued from page 23*)

backlog during the first quarter were these:

New England, up $1,600,000, 1 percent; Middle Atlantic, down $5,600,000, 1 percent; South, up $3,100,000, 1 percent; Middle West, up $11,500,000, 2 percent; west of Mississippi, up $16,200,000, 5 percent; Far West, up $300,000; total U. S., up $27,000,000, 1 percent. States showing the biggest gain in backlog during the first quarter were Ohio, Texas, Minnesota and Missouri. California and Michigan were reducing their backlogs in greatest proportion.

• **Proposed projects**—Indicative of the type and extent of sewerage projects facing cities are these:

Indianapolis has commissioned consultants to design additional sewers at an estimated cost of $2,000,000.

Richmond, Va., is undergoing considerable pressure for construction of sewage disposal facilities which would cost $15,000,000. Financing plans envisage a sewer tax based on water consumption.

Canton, O., has enacted an ordinance authorizing the sale of $3,100,000 in revenue bonds to finance a sewage garbage disposal plant.

Salem, Ore., has given top priority to sanitary sewer and sewage treatment projects which would cost $1,429,000.

Marion, O., told by the state that it must modernize its treatment plant and sewerage system, plans a $500,000 revenue bond issue.

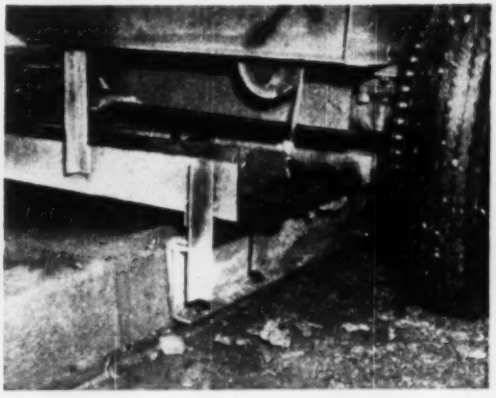
Toledo, O., plans to double the speed of its five-year sewer program. A $2,000,000 program for 1950 was ok'd after some of the worst flooding in years.

Honolulu, T. H., is in the midst of a 10-year program estimated to cost $23,000,000. Work planned for this year will cost $3,600,000.

Montana road commission names three to vacancies

Vacancies at the top level of Montana's Highway Department have been filled by the reorganized highway commission, which named a veteran Montana engineer to one of the major openings.

Troy Carmichael was named state highway engineer. He succeeds C. J. Stahl, who resigned last winter (ENR March 9, p 21). Other appointees by the new commission, which was itself reorganized by Gov. John Bonner recently (ENR April 27, p 26, May 4, p 9), are Al Giemer, plans engineer for the department who became acting secretary, and Harry H. Jones, who became commission attorney.



LAST WORD IN PAVING—Above left is the experimental machine developed by J. W. Johnson, a research engineer for the Iowa Highway Commission. A truck mixer is about to discharge concrete into the charging hopper. To the right, a close-in view shows the back end of the slip-form paver. The cable at right center raises the form when the machine is moved about the job. Immediately behind and just below it is the power-driven belt which finishes the pavement's top surface. Concrete used in these photos was approximately of 3-in. slump. The machine moved at 8 ft per minute. (Blaw-Knox Photos)

Concrete roads built without forms

Melvin Dean
Assistant Editor

"Like squeezing toothpaste out of a tube."

That's the apt description given a new piece of concrete-laying equipment. Designed for construction of low-cost secondary and tertiary roads, the machine threads out a continuous ribbon of concrete at speeds up to 10 fpm, using no forms or special equipment or materials.

Still in the development stage, here's how it stacks up now: It is no cure-all for paving contractors, but is a specialized unit for specific types of work. And, as it is one man operated, it is expected to reduce the cost of concrete county roads and city streets to a price comparable to other low-cost types of road and street construction. No allowance is made for handling reinforcing steel. Similarly, no allowance has been made for construction of expansion or contraction joints. However, the developers say it would be possible to place these manually after the slab has been formed or possibly by modifying the present machine.

• **Combines three operations**—Essentially, three operations are combined—those of a spreader, transverse finishing machine, and longitudinal float. All hand-finishing operations are eliminated. The machine is composed of two separate units—the forming device, which rests on and rides along the subgrade, and the propelling unit which drags the forming assembly along by means of link chain connection.

The forming unit consists of a hopper for receiving the concrete mix, vibrating units for compacting the concrete, slide forms riding on the subgrade and forming the vertical side of the slab, a sliding form which forms the top of the slab, and a reciprocating belt that moves transversely of the machine to form a smooth top surface. Lateral alignment is maintained by a rod projected forward of the machine, permitting the operator to follow the guide line. The machine can be steered around curves. Subgrades may be built in any manner specified by state, county, or city officials, and require no special treatment for operation of the paver.

Standard concrete mixes are used and may be delivered to the paver by transit mixers or be mixed on the job site. And, while it would seem that an extremely stiff mix is required, slabs have been built easily using mixes having 2, 2½, and 3-in. slumps. Either standard or air-entrained cements can be used. Asked why the slab, once formed, holds its shape, those in charge of development would offer no answer other than, "it just does." Experimental strips built so far certainly seem to uphold their statement.

• **Little cost data**—Cost-wise, not much data is available. On a 0.463-mile 20-ft-wide strip built for the town of Primghar, Iowa (O'Brien county), low bid, using standard equipment and methods, was $13,405. Actual cost of the finished road using the new machine was $7,921. In both cases, specifications were the same, and aggregate was furnished by the county.

Present development of the paver is being undertaken by the Blaw-Knox Co., Blawnox, Pa. Plans call for two models. One with a width range of 10 to 15 ft, the other with a width range of 20 to 25 ft. Widths of other sizes are easily made in multiple strips. In so doing, one set of wheels of the traveling unit rides on the already completed lane. As this unit is entirely separate, no difficulties are encountered because the forming device still rides flat on the subgrade. A small trapezoidal space, left between the two lanes, is later filled in with bituminous.

Blaw-Knox reports that it expects to have its commercial models available early in 1951.

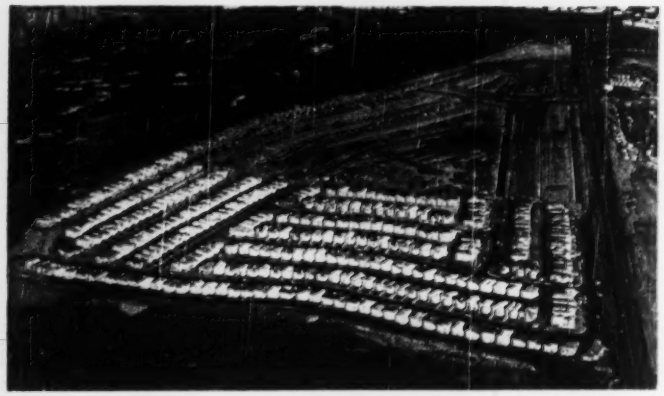
Original development of the machine was by J. W. Johnson, laboratory chief, and other engineers of the Iowa Highway Commission.

Seek revenue bond law for toll-free highways

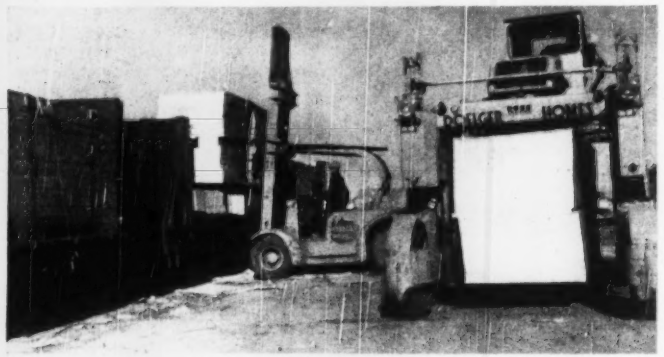
Detroit has asked the Michigan legislature to cut a decade from the completion time of two expressways designed to alleviate snarled traffic conditions which are afflicting the city heavily.

Gov. G. M. Williams broadened a special session call to include a measure authorizing the issuance of bonds to be backed by future highway revenues. Proceeds of the bonds would go to completion, within four years, of the Edsel Ford and John C. Lodge expressways. The authorization could cover other similar roads, also. The projected expressways will be free. At present financing rates, they'd take 15 years to finish.

Hills were leveled to provide a site for . .



WESTLAKE HOUSING PROJECT in San Francisco consisting of 7,000 wood houses. The builder, Henry Doelger, spent $450,000 on heavy equipment to move 10,000,000 cu yd of earth. He was able to sell at $11,650 to $23,000 or $8.40 per sq ft, because . . .



SPECIALIZED EQUIPMENT speeded construction. A 3-man crew with two pieces of mechanical lift equipment unloaded 45,000 sq ft of gypsum board from a flatcar and delivered the material to the site one mile away in 1¼ hr, at a cost of 25c per thousand ft, compared with 75c for hand unloading with a 4-man crew and truck, and 60% faster. (U. S. Gypsum Co. photos)

Jap cement threat stirs Northwest

Reports that the Defense Department will use Japanese cement in Alaskan military construction have stirred Pacific Northwest manufacturers.

Seattle hears that the department will use 8,000 tons of it in southeast Alaska between Sept. 1, 1950 and June 30, 1951. Bids were to be opened at Anchorage May 10 on 80,000 bbl more. Conditions on these bids would have resulted the Japanese the business, Seattle sources said. The opening was postponed following labor and business protests.

John C. Forrest, Seattle representative of the United Cement, Lime and Gypsum Workers, charged Army discrimination in favor of Jap cement. The Anchorage bid call provided that foreign sources would be exempt from certain conditions such as the 40-hour week, no convict labor and use of American raw materials. Apparently a more persuasive factor in favor of the Jap product, though, is a shipping charge reported to be only $2.50 per ton from Japan to Alaska. It costs $17 per ton from Seattle to Alaska. The lower rate, in Army chartered ships, is said to be motivated by the need for ballast for ships returning from Japan.

Olympic Portland Cement Co., which shipped 125,000 bbl to Alaska last year, has closed its Bellingham, Wash., plant because of failure to receive such orders this year. And Seattle hears rumors that the Japs plan to ship 125,000 bbl into Portland to sell in the U. S.

Waste disposal system eases Niagara Falls load

As its part in preventing overloading of the Niagara Falls city sewer system, the Electro Metallurgical Division of Union Carbide and Carbon Corporation is building a complete waste-water disposal plant of its own. Now partially in operation, the disposal system collects fluids from Electromet's furnaces, concentrators and fume and dust collecting systems.

These fluids pass through a network of underground lines to pumping stations on the plant grounds. Thence they are pumped through an 18-inch, 5,600-ft pipe line to Electromet's refuse property. Here, a thickener separates solids and fluids.

Overflow from the thickener is clear, treated water which is routed through Tuscarora creek, then Cayuga creek to the Niagara river. Underflow from the thickener, consisting of the solids that were entrapped in the water, is pumped to drying beds. Before the clear water reaches Tuscarora creek it cascades over an aerator—a series of wooden steps. This fall restores the oxygen to the water. Electromet's aerator for aerating ladders is modeled after the aerating ladders used by many fish hatcheries. The thickener and aerator are now processing fluids at the rate of 1,300,000 gallons a day.

Actually, the Electromet's waste water disposal system serves two purposes. It removes the dust and fumes collected in the plant's wet type dust collecting equipment and pumps the waste fluids to the refuse property, alleviating pollution of the river that might eventually occur if these fluids were placed in the city sewer system.

Service charge endorsed for Los Angeles sewer

Los Angeles City Engineer Lloyd Aldrich has added his endorsement to a recently proposed city sewer service charge to help pay the operating expenses of the new Hyperion sewage treatment plant, expected to go into partial operation in June.

A controversy between the mayor, council and the board of public works over who should be hired as top operating personnel—a firm of consulting engineers or local civil service employees—is still undecided.

Aldrich estimated a levy of 50 cents a month on business and home owners and 11 cents for each hotel room would produce a revenue of $3,859,124 annually. He also submitted proposals based on 75 and 104 cents, and $1 and 22 cents, with the corresponding estimated returns. Collection costs would be an estimated $275,000 a year, he said.

Water Resources Policy Commission schedules field hearings next month

Public and local government agencies to be solicited for local problems, advice—Five hearings scheduled for June, more in July

Regional conferences during the next two months are going to give local water users a chance to present their ideas to the President's Water Resources Policy Commission. Five area meetings from Arkansas to the Pacific Coast already have been scheduled for June. Two others—in New England and the Southeast—will be held during July.

Decision to hold local conferences was reached by the seven-man commission at its recent meeting at Washington. The commissioners want to give citizen groups an opportunity to express their views at hearings "back home."

Definite dates have been fixed for five June conferences, with meeting rooms and hours to be announced later. These conferences are:

Sioux City, Iowa, June 12-13; Spokane, June 16-17; San Francisco, June 23-24; Denver, June 27-28; Fayetteville, Ark., June 30-July 1.

New England and the Southeast will have their chance to be heard in July. Dates have not yet been set, but the meetings will be held in Springfield, Mass., and Atlanta, Ga.

• **Seek suggestions**—Commenting on the purpose of the regional meetings, commission chairman Morris L. Cooke said the area conferences will be informal, with a view to developing from representatives of state and local government agencies and citizen groups constructive suggestions on which sound national water policy can be based.

"These discussions will deal with such questions as: To what extent should federal government participate in major water resources programs and what should be the character of such participation? To what extent should industry's growing concern for adequate water supply be considered in formulating national policy? How can erosion be reduced? How can we get cleaner water in our streams? How can we assure adequate municipal water supplies? To what extent does water supply become a factor in the event industrial dispersal becomes necessary in connection with national defense?

"These and many other related important water requirements problems will be open for discussion in the area conferences, and thus afford the commission an opportunity to discuss these themes basic to our assignment at the centers where they arise."

On the water board's method of operation, the chairman said this:

"The commission has made every effort in its work to date to stress cooperation between federal, state and private groups, thus saving time and expense, as well as getting a better overall picture as the basis for a sound report to be given to President Truman on or before Dec. 1.

• **Government experts involved**—"The commission's organization is composed largely of experts detailed by the government departments most at interest—Agriculture, Army Engineers, Commerce, Federal Power Commission, Interior and Public Health Service. The work of these government employees is supplemented by specialists on water recruited from universities and state governments. Our organization is now functioning at top speed."

Cooke also stressed the assistance of colleges, technical groups and citizens associations in supplementing staff work at headquarters. Answers to the 18-point economic questionnaire already are coming in from the nearly 1,150 education institutions and organizations to which the inquiry was submitted at the end of March, with full replies requested by May 31. (ENR Apr. 6, p. 25)

EUROPEAN DESIGN—Maimonides hospital, just completed in San Francisco, was designed by Eric Mendelsohn, European architect now living in San Francisco. The 8-story, reinforced concrete structure, 100x60 ft and containing 83 beds, was built by Barrett & Hilp, San Francisco contractors. Isadore Thompson was consulting structural engineer.

REPRINTS AVAILABLE

Reprints of the article "What Engineers Can Do to Control and Cut Down the Cost of Rats," published in ENR for Apr. 6, 1950, may be had from the Editor, ENGINEERING NEWS-RECORD, 330 W. 42nd Street, New York City, 18, for 25 cents each.

New CAA airport plan lists big work volume

Three-year program would generate construction estimated at almost $1 billion at 5,093 locations

In its 1950 National Airport Plan issued this week, the Civil Aeronautics Administration lists 5,093 locations at which airports should be constructed or improved to meet demands for air service over the next three years.

Fourth in the series of such plans prepared by CAA—as required under the Federal Airport Act of 1946—the report presents a three-year forecast of construction projects on public airports considered necessary for civil aviation traffic.

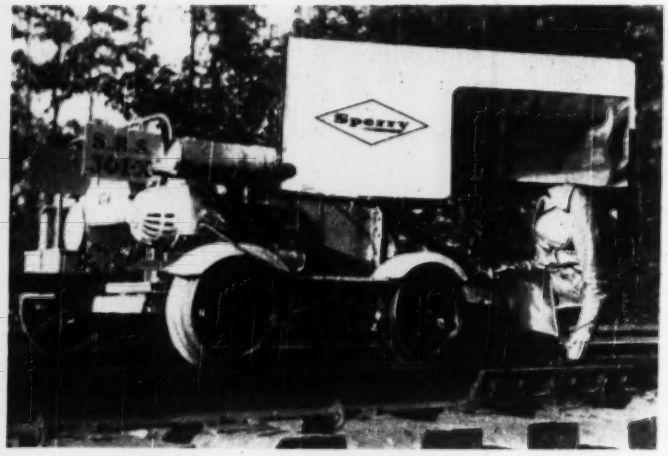
No funds, either federal or local, are assured by inclusion of a location in the plan. But, dependent on appropriations by Congress, CAA will put in its program for fiscal 1951 those locations that show the greatest need, according to the latest national plan just released.

• **Nearly $1 billion**—For its own guidance, CAA has estimated the cost of the work outlined in the plan at $928 million. Broken down, that would mean $446 million in federal and $482 million in local sponsor funds.

Among the 5,093 locations listed in the 1950 plan, 4,964 are within the continental limits, and 129 are in the territories. Of the projects, 2,316 are for improvement of existing airports, and 2,777 are for entirely new fields.

The plan lists 575 Class IV and larger airports, of which 25 are new and 550 for improvement. For the next size airports, Class III, the report names 597, 143 of them new and 454 to be improved. Most of the projects are for the smaller Class II and Class I airports; more than 3,500 in all, nearly 2,300 of them new. In addition, 312 seaplane bases and 66 heliports are listed in the plan.

Grouped by states, the plan shows for each project the present and proposed class of airport, type of scheduled air service, and status under the federal airport act. A summary for each state breaks the complete plan down by airport class, new airports, those recommended for improvement, and estimated cost in federal and sponsor funds.



NEW RAIL INSPECTION DEVICE—A new type of ultrasonic testing device is being used on railroads of this country, primarily to discover cracks or breaks in rail joints in place. It supplements the detector car that has been in use for several years to locate transverse fissures in rails. Only one man is required to operate this new device. He sits on a swinging seat at the rear of the trackmotor car on which it is installed, which permits him to test joints in both rails. He runs a small searching unit along the rail head at each joint which sends vibrations at very high frequency into the rail. These vibrations are reflected on a small screen under the hood over the operator's head. The screen shows any break in the beam of vibrations, whether caused by cracks or by the bolt holes themselves. However, the bolt holes establish a definite pattern so that the operator can recognize quickly any irregularity caused by a crack. The irregularities also show the exact location of the crack and its extent. The device was developed by Sperry Products, Inc., and is leased to railroads by the Sperry Rail Service, of Danbury, Conn.

Coulee storage available for floods this spring

Under an agreement reached by three federal agencies, use of flood control storage at Grand Coulee is expected to reduce materially flood damage in the Columbia River area during the spring runoff season.

Parties to the agreement are the Bureau of Reclamation, Corps of Engineers, and Bonneville Power Administration. The three groups decided that use of a maximum of 900,000 acre ft of storage would reduce the flood crest at Vancouver, Wash., by 1.2 ft. Use of more than that amount of storage would adversely affect logging, sawmill and other activities in the area.

The late spring and slow thaw of the heaviest snow in years in the Canadian Rockies have brought forecasts of flood conditions almost as serious as in 1948, when the Columbia reached its highest stage in 50 years. These forecasts brought about the decision to use Grand Coulee storage to reduce the menace. Grand Coulee was not constructed for flood control, only for power and irrigation, but representatives of the government agencies agreed it should be used as much as possible for storage without interfering with its normal functions or with private business operations.

A day-by-day control will be exercised during the flood period, in late May and early June. The Bureau of Reclamation will adjust discharge at Grand Coulee in accordance with daily requests of the Corps of Engineers, based on water and weather forecasts by the United States Weather Bureau.

Anti-speculation law upheld in Columbia Basin

In a decision regarded as of utmost importance to successful settlement of the Reclamation Bureau's Columbia Basin Project, Superior Judge Jay W. Whitfield, at Ellensburg, Wash., held applicable and valid the anti-speculation provisions of the Columbia Basin Project Act.

The decision came in a case brought by C. W. Hall against Franklin County Irrigation District No. 1. It sold Hall land within the project for $1,605 in excess of the appraised value fixed in accordance with the Act, and the terms of the recordable contract between the district and the United States. These provide that lands covered by the contract cannot be sold for more than the appraised value.

In holding for Hall, Judge Whitfield commented that "experience has shown that the early irrigation districts in the state and the owners of land made susceptible to irrigation by the various private and other companies had suffered from speculation by early settlers. It became notorious that it took three mortgage foreclosures before an irrigated tract of land was settled upon permanently. This provision in the Reclamation contract was intended to and has, largely eliminated the hazards of early settlers on newly irrigated lands."

This is the first court case testing these provisions of the Act.

North Carolina road dispute goes on

North Carolina road builders and the state highway commission continue at odds over the state's tremendous construction program. (See p. 136.)

Executive secretaries of the Carolinas Branch, Associated General Contractors, and the Carolina Road Builders Association issued a joint statement criticizing the commission's force account construction program and asking more work for contractors.

Shortly before this statement, spokesmen for the commission wondered out loud whether North Carolina contractors didn't have about as much road work as they could handle. They noted that there had been a distinct slump in the number of contractors submitting bids at April lettings. Chief Engineer W. H. Rogers, Jr., said "this might be due to more caution on the part of contractors or it may be that most firms are loaded with work." At the next subsequent bid opening, though, Rogers "noticed some increase in competitive bidding."

The associations' joint statement said flatly that:

"There are several million dollars worth of equipment standing idle due to an insufficient amount of work being let to contract."

It added that contractors who ordinarily would continue their operations to the state have had to go beyond its limits for work.

Meanwhile, the state Supreme Court upheld the commission's purchase of road building equipment with bond funds, dismissing a suit brought by Contractor Nello Teer. With the ruling, Rogers announced that the state does not contemplate large scale additional purchases of equipment for the rural roads program. Most state work will be on small, scattered jobs, commission sources indicated.

Buses and foundries fight smog in L. A.

Foundries face end of permits this month without accepted substitute—Test propane-fueled vehicles

Los Angeles' vigorous smog control program was in the news this week on several fronts with these developments:

1. A transit company tested propane-fueled buses as a means of cutting down exhaust fumes and solid discharges.

2. Dar-Howell Manning, Inc., became the first gray-iron foundry to submit a plan for elimination of emissions of air pollutants.

3. The Eljer Co. announced it would suspend operations at its $1,500,000 plant, partially because of labor troubles, partially because it found smog control rules unworkable.

The smog control board, while not unhappy about the propane bus proposal, indicated that it considered automobiles much worse as air polluters. It figures the maximum daily contribution by trucks and buses, on a test for SO$_2$ emission, as five tons. Automobiles contribute a maximum of 25 tons, the board found. Senior Inspector W. H. Parmelee, of the Los Angeles County Air Pollution Control District, conceded that propane-fueled equipment could well be the answer to the problem of irritating motor exhaust in highly congested areas. And a district spokesman added:

"Certainly, if we could avoid reports on orange tree blight from exhausts on highways and rid downtown streets of fumes, our program would be that much more successful."

• **Substitute electric furnace**—Dar-Howell Manning has submitted plans for installation of a direct-arc, two-ton capacity electric furnace to replace an existing cupola. It expects authorization to install it, but such authorization does not guarantee a permit to operate. Meanwhile, it has asked for an extension, until the furnace is ready to operate next month, of a year-old permit to operate existing facilities. More than 40 other gray iron foundries face expiration of similar extensions May 22. A joint committee representing these foundries has been seeking answers to gas cleaning problems. Under consideration are water washers, glass and wool bags, steam cleaners, centrifugal cleaners and electrical precipitators. Reports will be made at a hearing May 22 on the costs and efficiency of each.

Members of the committee have said compliance with the terms of the smog control act is impossible, and base this feeling on the definition of the permissible discharge in relation to tons of iron poured.

Officials of the Eljer Co., which faced costs of almost $50,000 to control precipitation at 85 percent of the requirement, said that 85 percent efficiency is possible, but that complete compliance isn't with any equipment now designed or offered.

Eljer complained the smog control officials were of no assistance, and would go no further than to approve plans for abatement equipment.

Studds succeeds Colbert as chief of USCGS

President Truman has nominated Capt. Robert E. A. Studds, veteran of World War I, to be director of the U. S. Coast and Geodetic Survey. Captain Studds, who has served with the CGS for 31 years, will take the rank of rear admiral on confirmation. He succeeds Rear Admiral Lee Otis Colbert, who retired April 7 after 42 years.

Studds received a B. S. in Civil Engineering from Catholic University in 1917. During World War I, he served with the 42nd Engineers, after service with the District of Columbia government in an engineering capacity. Joining the Coast and Geodetic Survey thereafter, Captain Studds commanded half a dozen ships for the bureau. He has aided in the survey of waters in the Atlantic Ocean, Gulf Stream, Pacific Coast, West Indies, Alaska and in the Philippine Islands.

His latest command was the Pathfinder, one of the survey's newest vessels, which he took into eastern Alaskan waters. At present, he is chief of the Division of Charts, Washington, D. C. In 1936, he commanded the Fathomer, which was tossed on a coral reef by a typhoon.

Tried an A-bomb yet?

C. G. Byson, head of the C. G. Byson Building Material Co., Glendale, Calif., and a veteran building demolisher, said his company had almost met its match when it undertook to raze the Ethyl Building, Los Angeles, to make way for a freeway.

"Talk about earthquake proof," Byson moaned, "this baby is almost raze proof."

He said the two-story reinforced concrete building, built by the Ethyl Corp. in 1938, took the battleship blows of a 3,000 lb steel ball with stolid resistance.

Byson said demolition work was going to be harder and harder as the years go by, because of the added strength built into present day buildings.

"We may have to develop some sort of explosion technique," Byson predicted.

New contract forms in use by government

Provisions to help small business, balk "five-percenters" are included — Two types replace many

New contract forms for all supply and equipment purchases by federal agencies have gone into use officially.

Use of the new forms does not become mandatory until Oct. 1, to allow time for adjustment by any agency that might have special difficulties in making the changeover. For all practical purposes, however, the General Services Administration expects the forms to be in use by almost all Government agencies by May 8.

GSA and the Department of Defense worked together in developing the forms to make them uniformly applicable to both civilian and military agencies.

• **Small business protected**—As a yardstick for measuring the size of each firm that bids for a contract, the revised forms include a question on the firm's total number of employees. This question, GSA Administrator Larson says, is to help government agencies carry out the policy enunciated by Congress and the President—that small business get its fair share of contracts.

Under the new dispensation, contract forms of two types replace the former plethora of government paper for supply and equipment purchases. As a further simplification, a consolidated single set of general conditions—applicable to either of the two types of contracts—takes the place of all previous separate provisions.

These general provisions—accompanying the bid forms—spell out twenty terms of agreement. They include the provisions required by Congressional actions, such as adherence to various labor laws, as well as bond security clauses, assignment of claims and others.

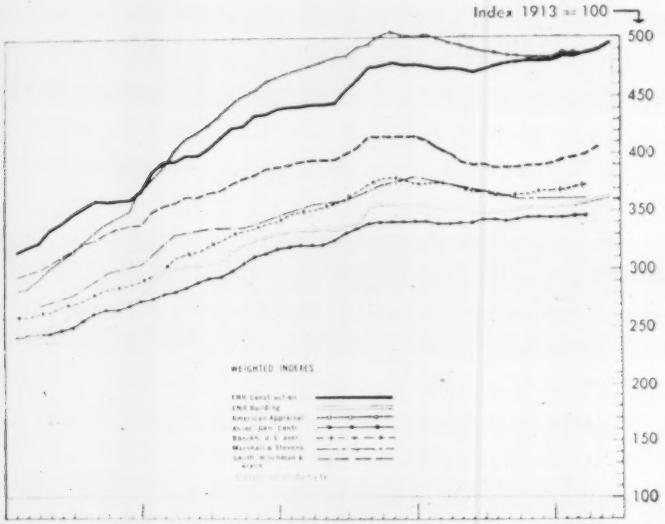
Provisions specifically relating to taxes, to inspection and to defaults have been expanded in considerable detail. The hope is to minimize the possibility of misunderstanding.

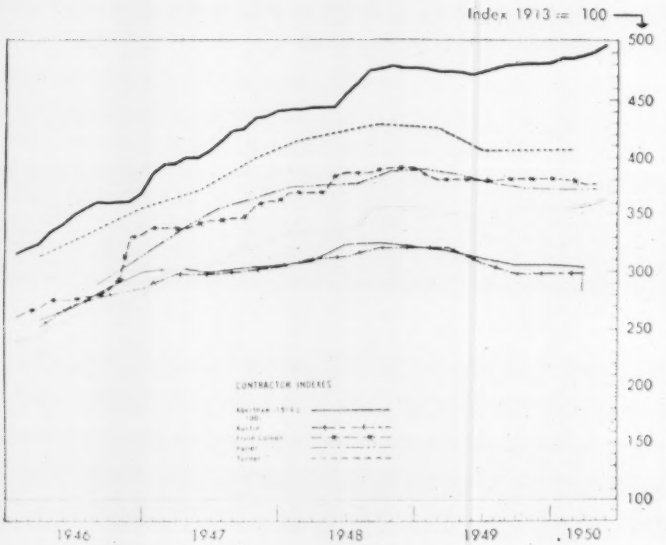
With a further eye to the "five-percenters," the revised forms include another new requirement.

Where more than $25,000 is involved in an advertised contract or more than $1,000 in a negotiated contract, the bidder must declare whether or not he has retained a special representative, other than a full-time employee, to help solicit the contract.

Larson said that the statements about the employment of special representatives and the payment of contingent fees would protect the government, business, and legitimate manufacturers' representatives.

CONSTRUCTION BUSINESS





Construction costs up, prices steady

A rounding-out construction cost and price indexes for the first quarter shows costs rising while prices hold steady. The ENR Construction Cost index is up 3.5% since December, and it's still climbing.

The index for May 1 is 546.55 (1913 = 100), up 0.95% from April 1. It is now 3.4% above the 1948 high and 5.2% higher than the 1949 low.

The Building Cost Index is now 556.27, 0.41% above April 1. It tops the 1948 high by 2.0% and the 1949 low by 4.4%.

Wage hikes account for most of the steady gain in costs since the first of the year; rising lumber prices also contribute.

• **All show cost rise**—Every weighted index of construction cost tells the same tale. The Smith, Hinchman & Grylls index shows the biggest 1950 rise—up 3.8% from December to April. Other indexes, available only through March, show fractional gains for the first quarter. The E. H. Boeckh indexes of building cost are up fractionally for March. The national average for all types of commercial and factory building is up 0.4% to 573.5 for March (1913 = 100); this is 1.4% above December, 1949.

• **Contractor prices down**—While wage and material costs are rising, contractor price-cost indexes have declined or held steady this year.

Frank Colnon's April index was the same as March at 577, but it was 1.5% below last December. The Aberthaw index for March was 304.6, almost 1% lower than December.

Other contractor indexes were steady during the first quarter.

Weighted indexes	Prev. report 1949	Latest report 1950	% chg
ENR Construction	486	May 497	+2.1
ENR Building	552	May 564	+2.1
American Appraisal*	458	Mar 474	+3.6
Associated General Contr.	345	Mar 349	+1.2
E. H. Boeckh	368	Mar 372	+1.1
Smith Hinch. & Gryls*	392	Apr 407	+3.8
Marshall & Stevens	261	Mar 262	+0.3

*Corrects for productivity

Contractors indexes:			
Aberthaw	307	Mar 305	−0.7
G. A. Fuller	353	Apr 353	0
Turner	467‡	Feb 467	0
Frank Colnon	585	Apr 577	−1.5
Austin	295	Mar 295	0

‡January, 1950. ‡November, 1949.

Contractor failures

For the past year, news of rising costs and dropping bid prices has kept the warning flag flying for construction contractors.

That the danger is real is evident from the Dun & Bradstreet report that 858 contractors failed in 1949, heaviest mortality in 15 years on record. Building contractors account for 325 of these failures, other general contractors for 40. Subcontractors headed the casualty list last year with 477 failures or 56%.

Construction Business Failures
(Dun & Bradstreet reports)

Type of contractor	No. of failures January–March 1948	1949	1950
General building	55	85	73
Gen. subcontractors	26	101	142
Other types	7	33	9
Total	88	219	224

	Years 1948	1949	1950
General building	55	145	325
Gen. subcontractors	25	24	477
Other types	2	49	56
Total	82A	218	858

In the first quarter of 1950, general contractor failures are down a little. But subcontractor mortality is up to 142, this compares with 101 last year and 50 the year before.

BIDS AND BIDDERS

(Major project news received after Construction Reports, page 89, went to press)

Plant—McGraw Construction Co., Middletown, O., has been awarded contract to build plant at Syracuse, N. Y., for Solvay Process Division, Allied Chemical Co. The total estimated cost with equipment is $20,000,000.

Veterans Hospital—Veterans Administration, Washington, D. C., will open bids July 18 for the construction of hospital at Oklahoma City. The project, to cost $12,000,000, will adjoin the University of Oklahoma School of Medicine.

Stilling Basin and Power House—U. S. Engineers, Bismarck, N. D., received lowest bid for constructing stilling basin and power house foundation for Garrison Dam and Reservoir, in North Dakota, from United Construction Co., Winona, Minn., at $9,749,245.

Veterans Hospital—Corlett-Thompkins-Winderlich, Washington, D. C., will construct $11,634,626 hospital at Salisbury, N. C., for the Veterans Administration, Washington, D. C.

City Prison and Remand Center—Department Public Works, City of New York, will take bids June 14 for city prison and remand center at proposed Civic Center, Brooklyn Boro. Alfred Hopkins Associates, New York, designed structures which will cost about $6,000,000.

Office—Angus Robertson, Ltd., Montreal, Que., has been awarded contract for East Block Office Building at Ottawa, Ont., for Department of Public Works, Dominion Government, Ottawa, Ont., at $5,170,000. Allward & Gouinlock, Toronto, are architects.

Memorial Coliseum—Franklin County War Veterans Memorial Building Committee, Columbus, O., plans memorial coliseum at Columbus to cost about $4,500,000. Allied Architects Associated, Columbus, is architect.

Dwellings—Reed & Yancey Construction Co., Houston, plans building dwellings at Houston to cost about $3,950,000. W. H. Yancey, Houston, is architect.

Underground Telephone Conduits—Southwestern Bell Telephone Co., Houston, plans underground telephone conduits in Houston, Jacinto City, Greens Bayou and Channelview at about $3,000,000.

Apartment—Northgate Co., Seattle, Wash., awarded contract for apartment in Seattle, to Howard S. Wright Co., Seattle, at about $2,000,000. John Graham & Co., Seattle, is architect.

Highway—Williams Construction Co., Middle River, Md., was low bidder at $1,448,980 for improving road in Howard County when the Maryland State Highway Commission, Baltimore, received bids April 25.

School—Whittier Union High School District, Whittier, Calif., approved $2,500,000 bonds for constructing schools. William H. Harrison, Los Angeles, is architect.

Hotel—J. A. Jones Construction Co., Charlotte, N. C., was low bidder at $2,060,000, for constructing Jung Hotel addition, in New Orleans. Weiss & Silverstein, New Orleans, are architects.

Lumber Mill—Long-Bell Lumber Co., Longview, Wash., plans rebuilding mill destroyed by fire, at Vaugh, Ore. Estimated cost is $2,500,000.

Filtration Plant—City of Allentown, Pa., received low bid for constructing Contracts 1 and 2 on city filtration plant from Progressive Builders, Inc., Camden, N. J., at $1,871,660. Morris Knowles, Pittsburgh, Pa., is engineer.

Dwellings—Chocolate Bayou Estates, Houston, plans dwellings in Houston to cost $5,500,000. Knostman & Webster, Houston, are architects for the project.

Coralville Reservoir—Texas Construction Co., Dallas, has been awarded $1,053,588 contract to construct Stage 2, Coralville Reservoir, Iowa River, Johnson County, Iowa, by U. S. Engineers, Rock Island, Ill.

Housing—Allied Construction Co., Idaho Falls, Idaho, plans constructing housing at Idaho Falls and similar project at Blackfoot. Each project will cost $2,000,000.

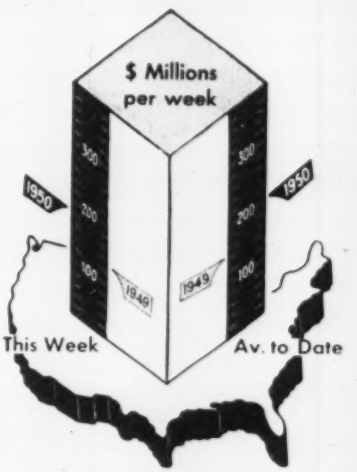
Sewage Treatment Plant—City of Rochester, Minn., will vote May 16 on $2,500,000 bonds for sewage treatment plant and additional sewers. Foltz, Kink & Day, St. Paul, are consulting engineers.

High School—Board of Education, Dayton, O., plans constructing vocational high school. Estimated cost is $2,000,000.

COSTS AND VOLUME

ENR INDEX NUMBERS

Index Base — 100		1913	1926
Construction Cost	May '50	496.55	238.69
Building Cost	May '50	364.27	196.91
Volume	Apr. '50	287	170



Activity This Week

As reported to ENR (in millions of dollars)

Amount of contracts let

	Week of May 11 1950	Cumulative 1950 thru wks.1	Cumulative 1949 thru wks.1	% chge
Federal	$ 5.6	$ 70.0	$ 55.1	+27
State & Mun.	61.6	1,129.6	992.7	+14
Total Public	$ 67.1	$1,199.6	$1,047.8	+14
Total Private	90.2	2,244.5	1,924.9	+17
U. S. Total	$157.3	$3,444.1	$2,972.7	+16

Contracts by type of work

	This Week	Cumulative 1950 thru wks.1	Cumulative 1949 thru wks.1	% chge
Waterworks	$ 2.4	$ 58.3	$ 39.7	+48
Sewerage	2.6	85.5	85.6	0
Bridges	5.0	112.2	118.7	−5
Highways	23.4	292.1	210.9	+38
Earthwork, Waterways	7.8	142.6	228.1	−37
Buildings:				
Public	12.1	712.2	568.6	+25
Industrial	12.1	388.1	364.5	+6
Commercial	76.4	1,661.7	851.3	+95
Unclassified	14.5	326.1	295.9	+10

NOTE: Minimum size projects included are: Waterworks and waterway projects, $25,000; other public works, $50,000; industrial buildings, $68,000; other buildings, $250,000.

New capital for construction

	Cumulative 1950 thru wks.1	Cumulative 1949 thru wks.1	% chge
Corporate Securities	$650,182	$1,015,950	−37
State & Mun. Excl. Housing	743,889	729,093	+2
Housing	222,619	300,420	−25
Total Capital	$1,607,181	$2,045,463	−21

More miles of concrete pavement will be constructed this year as . . .

Ohio Gets Set For its Biggest Road Program

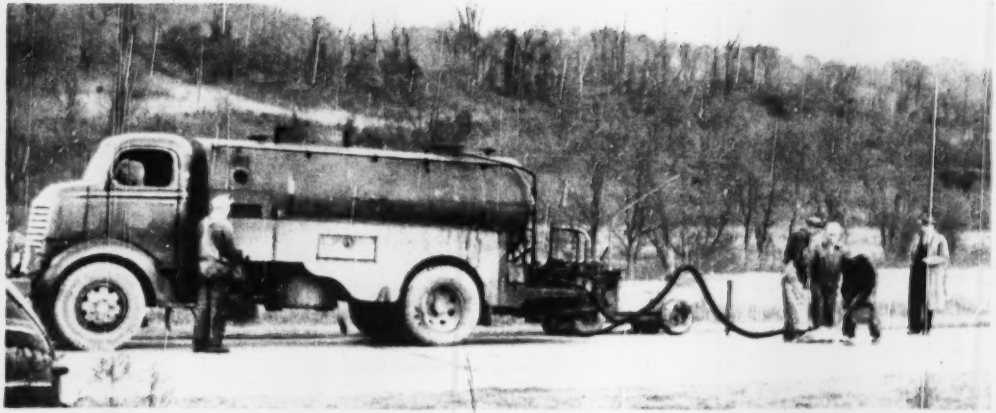
Ohio won't win its battle with the rapidly developing "obsolescent" highway this year or next, and perhaps not for many years to come. But the many innovations put into effect by the state highway department during the past several months have made possible an expanded, fast-moving roadbuilding program in 1950, with chief emphasis on increasing the tempo of construction as well as reducing costs.

Not only is the department getting set for the biggest construction program in its history, this season, but it is laying the groundwork for sustaining programs of equal or even greater magnitude.

High points of the department's developments in organization, planning and programming, location and design, and the training of an adequate technical staff are presented in the following. Activities of the other bureaus of the department to speed the work and reduce costs of construction and maintenance will be published in subsequent issues of ENR.

Two noteworthy trends, already apparent, are: (1) highway construction costs are coming down, and (2) the tempo of the work is being sharply increased. Contract prices are averaging from 10-30% under those of a year ago, while this year's dollar volume of construction is expected to be 2½ times last year's. This healthy condition of decreasing costs and increasing construction productivity is a combination of several factors, with competition among contractors rated as the greatest single factor.

The state highway department, reorganized early last year, has been



MANY MILES of old rough pavement will be leveled up this year either by subsealing with a heavy liquid asphalt, as shown, or by "mud-jacking" with a cement slurry.

built up to greater efficiency. It has a substantial backlog of prepared plans, enough money and engineering manpower to handle this year's construction program—estimated to reach $70,000,000—and there promises to be enough contractors to handle the work.

Spark-plugging this organization of 7,700 persons is Ted J. Kauer who recently ended his first year as director of the department. During that period he introduced several innovations aimed at increasing the productivity of his several bureaus, thereby reducing the cost of preparing design plans, making field surveys and supervising construction. Contractor-engineer relations have been improved substantially, and more workable measures have been adopted for improving field supervision without hampering construction progress.

• **New bureau established**—For one thing, Kauer established a new bureau—the Bureau of Planning and Programming. This new bureau takes a great load off the overburdened Bureau of Location and Design, enabling it to *function more efficiently.*

Other cost-cutting and time-saving measures introduced by Kauer include: The adoption of concealed engineers' estimates on state projects (Federal-aid projects already carried concealed bids); a highway training program to develop young engineers in the department; reclassification of engineers into ten grades for more equitable compensation for work performed; streamlining the processes of right-of-way acquisition and plan preparation to implement urgently needed highway improvements; and reduction of the required amount of city participation in the costs of freeway and urban highway construction costs.

Mr. Kauer also has engaged consulting engineering firms to help get the department over the "hump" in its 1949-1950 construction programs; accepted the position of secretary and treasurer of the Ohio Turnpike Commission; set up a 16-state study of truck weights and sizes; and expedited the long-range study of Ohio's highway needs.

• **Planning and programming**—Chief responsibilities of the newly-created Bureau of Planning and Programming are—as its name implies—advance planning and programming of all highway improvements. Headed by Norman M. Wilke, chief engineer, and C. H. Makeever, assistant chief engineer, plus a staff of 14, this bureau functions well in advance of location, right-of-way acquisition and plan preparation. For example, it recently finished setting up the 1951 highway improvement program and is starting on the 1952 program.

The Planning Survey Section of the highway department with its 125 personnel was transferred to the Bureau of Planning and Programming, as was the railroad crossing engineer.

Starting with the budget for a year's construction program—based either on funds available or estimated—a tentative construction program is set up, including construction priorities for the various projects.

This is followed by securing the adoption of all necessary "consent legislation" needed for certain urban construction projects. In some instances this is covered by joint participating agreements with municipalities and counties cooperating in the improvements.

When the current long-range study of Ohio highway needs is completed this fall, it will be turned over to the Bureau of Planning and Programming for further refinement. The ultimate aim is to secure a "deficiency" or "sufficiency" rating on all rural and urban projects on the state system. Priorities of reconstruction then can be established for the various sections of highways based on these ratings, with proper adjustments made from time to time.

The long-range study of Ohio's highway needs is headed by J. P. Buckley, of the Automotive Safety Foundation, as consultant to the state highway department. C. E. McCormack is supervising engineer.

• **Highway training program**—Recruiting of young engineers is of vital importance to the state highway department. Although only one year old, this program has already shown great promise.

There are 135 engineers now in training in the department, compared with about 25 this time last year. This number will be increased from time to time since there is a definite trend of engineers returning from private practice to highway work. Also, from 30 to 40 young engineers must be recruited each year to take care of normal replacement.

The highway training program works like this: Those enrolled in it must be graduate civil engineers, and they must have applied for registration as a Professional Engineer in Ohio.

The training program runs three years. Starting salary is $264 per month, and is increased to $345 per month upon receipt of a professional license. The trainee's time is divided between the central and division

WIDENING of structurally sound but narrow pavements (at left) and resurfacing of existing pavements (at right) have been highly mechanized, to speed the work and reduce its cost.

offices, also between office and field work.

During his 3-yr training the trainee spends 6 months on bridges, 7½ months on construction, 10½ months on location and design, and 3 months each on maintenance, planning and programming, traffic and safety, and testing. By the end of this program the trainee has more than a working knowledge of the various departmental activities, and is ready to be assigned permanently to the phase of engineering he is best suited for.

• **Location and design**—The Bureau of Location and Design is being geared to turn out enough field surveys, plans and specifications to constitute a $60,000,000 highway improvement program for 1950. This program, covering federal-aid primary, secondary and urban highways, and state-aid roads—plus about $10,000,000 worth of new bridges—will total $70,000,000, the largest in the department's history.

Far-sighted engineers in the department do not, however, view this as an unusual accomplishment; they anticipate continued yearly construction programs of this magnitude, or even larger.

Field surveys, design plans and specifications for highway construction are prepared in the state's 12 division offices; bridge plans are prepared in the central bridge office at Columbus.

Several measures have been taken to streamline and speed up the production of road and bridge plans to insure this $70,000,000 road and bridge construction program being a reality for 1950. All division offices have been instructed to report only those projects on which plans definitely will be ready to advertise for letting by Sept. 1. This will permit the execution of construction contracts for all such projects by the first of next year.

To make the program even more definite, delivery dates have been established for sending completed road plans to the central office for overall review and advertising for letting. Delivery dates also have been established for completed bridge plans. By coordinating the delivery dates of road plans and bridge plans, the department can set up an orderly sequence of contract lettings for the various projects.

• **Traveling engineers**—The central office renders all possible aid to the division offices in preparing road plans. It has four traveling engineers who assist the division engineers in making on-the-spot approval of road design questions. If some highly technical issue is involved, a trained technician is sent out from the central office.

Right-of-way acquisition also has been streamlined and speeded so as to not hold up the awarding of contracts. Division offices secure all right-of-way. They are aided in this work by a 15-man "floating crew" of negotiators especially skilled in securing right-of-way. In infrequent instances, however, all negotiations are unsuccessful, and the right-of-way must be secured through the courts, by Right of Eminent Domain.

• **Aerial surveys**—Another time-saving and cost-reducing innovation is that of aerial surveys by state crews operating a state-owned aeroplane. Contours at 1-ft intervals prepared from these photogrametric surveys are sufficiently accurate for bridge-site surveys. In fact, 50 site plans for proposed bridges were made by this method last year, saving an estimated 3,000 man-days of bridge surveying time.

Photogrametric surveying has been even more profitable in labor-saving and cost-reduction on secondary road improvements involving relatively little physical change in alignment or profile. State law requires a plan and profile for all such work.

Aerial surveys enabled the division offices of the Bureau of Location and Design to prepare plans and profiles last year for more than 100 mi of secondary road improvements. This resulted in an inestimable saving in time and money over the conventional method of surveying by ground crews.

• **No compromise on quality**—In simplifying its construction requirements, however, the highway department has made no compromise on quality. In fact, portland cement concrete pavement has been increased to 9 in. in thickness, and the amount of reinforcement has been increased from 56 lb to 85 lb per 100 sq ft. Granular subbase also is required under all concrete pavement. Expansion joints have been eliminated in concrete pavement except at bridge ends; and the contraction joint spacing has been increased from 40 ft to 100 ft.

Another policy change adopted by the department in its standard specifications is that of permitting a 24-ft width of concrete pavement to be placed in one strip. Heretofore, the specifications required it to placed in two 12-ft widths, doweled at the centerline.

Whether or not this will effect a reduction in construction costs is a moot question. When six of the state's biggest concrete paving contractors were advised of this, then proposed, 24-ft permissible paving width, three said they would pave 24-ft width, but the other three said they would stick to paving two 12-ft lanes.

The $70,000,000 road-improvement program planned for this year (all to be by contract) is only 10% greater than the 1948 program ($59,000,000), but it is 140% greater than last year's program ($27,000,000).

• **Poor showing last year**—The truth of why last year's roadbuilding program was so disappointingly small is this: On January 1, 1949 the political administration of the state changed. The previous administration had awarded contracts for all projects on which plans had been prepared. With no backlog of prepared plans, the new administration had to start from scratch. And it was late spring when the new and reorganized department settled down to preparing plans and awarding contracts in earnest.

In spite of this political upheaval, the department awarded $27,000,000 worth of road improvements last year. It included 305 mi of asphaltic concrete; 38 mi of portland cement concrete (mostly reinforced); 36 mi of plant-mix and road-mix bituminous pavement; 86 mi of bituminous surface treatment and soil stabilization; 36 mi of soil-cement stabilization; and 8 mi of miscellaneous construction—a total of 507 mi of road improvements.

Karl E. Rothermund is chief engineer of the Bureau of Location and Design, which employs 420 in the 12 division offices and 115 in the central office. Ralph J. Tchieman is assistant chief of the bureau.

British Have Water Trouble

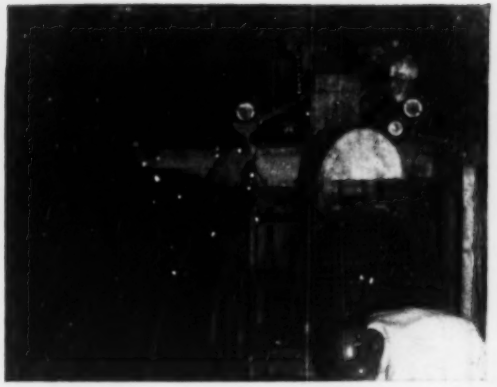
New York's current troubles with its water shortage (ENR Jan. 12, p. 27) are closely paralleled by the worries of British cities. Britain also had an unusually dry summer in 1949.

One of the more interesting solutions to the problem of conservation was that of the Tynemouth Corp.

After some experimentation, the corporation's engineers decided that any drastic move such as complete shutting off of water for stated periods would achieve too little in the way of saving since householders simply filled vessels before the shut-off occurred.

Final solution was to send inspectors to each house in the community to close off main valves to permit only a specified amount of water to flow from the taps. By this means (which did not include a restriction on industry excepting voluntarily) a saving of nearly 50 percent of domestic supplies was achieved.

AIR-OPERATED BOOMS, in first tunneling use, help Frazier-Davis men position five drifters quickly, on . . .



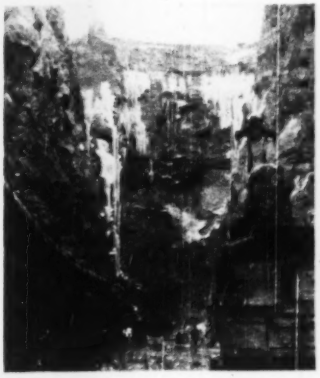
JUMBO for driving Neversink Tunnel rock heading. Blower on jumbo's rear draws dust, vapor away from face.

Up-to-Date Tunneling at Neversink

. . . with some old-fashioned hand-mining thrown in

NEW YORK'S DREAM of supplementary water from the Delaware River watershed will begin to come true in 1953, when Neversink Tunnel goes into operation. This five-mile bore will connect Neversink Reservoir, on a Delaware tributary, with Rondout Reservoir, in the Hudson River valley. From Rondout, the water will go 80 miles to New York, through the Delaware Aqueduct (ENR Jan. 14, 1937, p. 41, etc.).

The drawing below shows 25,630 ft of main tunnel and 1,780 ft of discharge-conduit tunnel. These will have a finished diameter of 10 ft, except in the lower 1,050 ft of main tunnel, where diameter will be 8 ft. The conduit is holed through, and work is progressing in both main portal headings. With the exception of 372 ft in earth, the entire length is in rock.

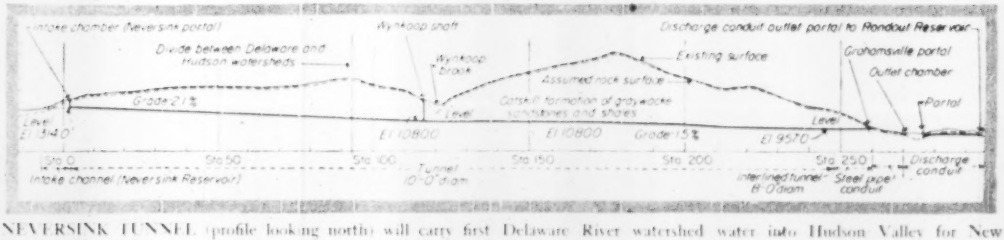


INTAKE PORTAL was opened in December, 1949, after months of excavation for intake chamber, whereas . . .

DISCHARGE CONDUIT heading was started in July. Work on this 1,590-ft section slowed in 153 ft of soft ground.

• **Rock tunneling methods.** In tooling up for 250 ft of weekly progress per heading, contractors Frazier-Davis of St. Louis had the benefit of two post-war devices, the carbide-insert rock bit and an air-operated boom for handling drifters. The former was just coming into full recognition when the job started; the latter had been used in mines, but was enjoying its first application to construction tunneling.

A rail-mounted two-deck drill carriage carries six of these air booms, three on the top deck forward, two



NEVERSINK TUNNEL (profile looking north) will carry first Delaware River watershed water into Hudson Valley for New York's water supply; will connect Neversink and Rondout reservoirs, part of New York Board of Water Supply's Delaware project.

TRANSITION from rock to earth (left) called for change in rib shape and spacing; air mucker shown. Soft-ground heading had rock bottom; man at top drift bench (above) indicates water inflow.

on the bottom deck, and one aft for auxiliary drilling (under-break, car-passer and double-track excavation, and pin holes). Air motors hoist the booms, which traverse manually. Drifter position at the boom end (swing and elevation) also is obtained manually. Drifters have 3½-in. bore, 4-ft aluminum shell and feed.

Carbide insert bits of 2-in. and 1⅞-in. size, respectively, drill 4-ft increments for a total hole depth of 8 ft on the horizontal. The hole size change is dictated by the latest practice (ENR, Feb. 9, p. 55) to reduce the number of stuck drills. Other accepted carbide-insert practices include making one man responsible for all bits, and pulling bits out of the heading once a day for regrinding before they get so dull they are likely to mean excessive insert breakage. (Dull bits will continue to cut.) Frazier-Davis gets 1,600 ft average drilling out of its bits in the tunnel's predominant rock, a relatively soft red shale (1,400 ft in sandstone).

A firing round includes 30 holes, loaded with 260 lb of explosive. Six rounds are fired in a 24-hr day, each pulling 7½ ft, to account for a powder expense of 0.4 lb per cu yd of muck.

Rock is removed by a 75-hp Conway mucker. An air-operated mucker has worked parts at the job. Electric power for the mucker is brought into the tunnel at 2,500 volts, stepped down to 440 volts by a transformer kept within 1,000 ft of the machine.

In the Grahamsville heading, 5-yd side dump cars drawn by battery locomotives haul the material outside to hillside hoppers that feed trucks for dumping at a nearby spoil area.

In addition to the hoppers, facilities clustered about the portal include a concrete plant, plus the customary compressor and blower house, change house and shops, as well as a gunite house. At the Neversink portal part of the facilities are at the top of the intake chamber cut, 70 ft above tunnel grade. The blacksmith shop is notable because it appears less fully equipped than those of the steel buggy. Instead of the automatic grinding machinery formerly encountered, there is merely a small bench grinder all that is necessary for the carbide inserts.

• Rock-scaling a major operation—One shop that's not so customary is the gunite house, where dry mortar materials are mixed and sacked for loading on a three-car rock-scaling train. (See picture of train with air-placement equipment.) These facilities are on the job because of the type of rock predominating in the tunnel. The red shale weathers quickly on exposure, and if it were not for the air-placed mortar, the engineers soon would have to require steel ground support throughout a substantial part of the tunnel. Instead, they require immediate scaling wherever the rock will weaken on exposure.

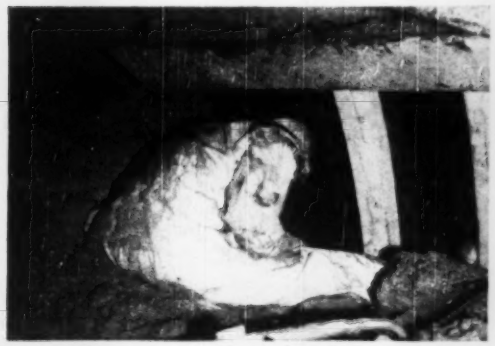
In the first 8,000 ft from the Grahamsville portal, 6,800 ft were sealed with mortar (about $2,900 per lin ft; 380 ft of steel support was installed, at about $40 a foot. Engineers say they have another reason for being liberal with the mortar: tunnel workers' morale improves because they feel safer under the soft rock when it's covered. Moreover, this lining doesn't slow tunneling progress the way a steel installation does.

• Earth tunneling methods—For the soft-ground portion of the discharge conduit tunnel, the contractor elected to open-cut 190 ft. This left him 183 ft to tunnel. The distance was so short, he chose old-fashioned hand-mining methods as the basis of excavation for a top drift, adapting these methods to modern structural steel rib and pressed steel liner plate construction (see picture series). Then he loosened the bench by blasting, for mechanical mucking and hauling. This was the final operation for excavation in the discharge conduit. Rock tunneling similar to that in the main headings progressed 150 ft per week. The slower rate was due to the presence of three horizontal curves, with intersection angles up to 40 deg., and to the necessity of placing steel roof support. Part of the services for this heading were performed at the Grahamsville portal.

The contract also includes an intake chamber (ENR Jan. 6, 1949 p. 60), a release-water tunnel to the Neversink Dam diversion tunnel, an outlet chamber and a hydroelectric power plant at Grahamsville and a 377-ft shaft. The shaft is excavated and lined to tunnel grade; it may be used for construction in the unlikely case that tunneling progress slows.

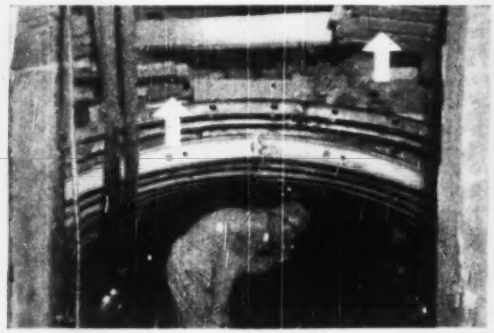
Project manager for Frazier-Davis Construction Co. is Roy J. Gauthier; field superintendent, Ted McCoy; assistant superintendents, Jim Wilson, W. H. Robertson and Dean Luther; master mechanic, Hite Riggs; electrical superintendent, George Patrick. Neversink division engineer for the New York Board of Water Supply is Frank J. Musso. He is assisted by John G. Mergett at Grahamsville and Ellsworth B. Wilke at Neversink.

. . . Good Tunnel Work Proceeds Step by Step at Neversink

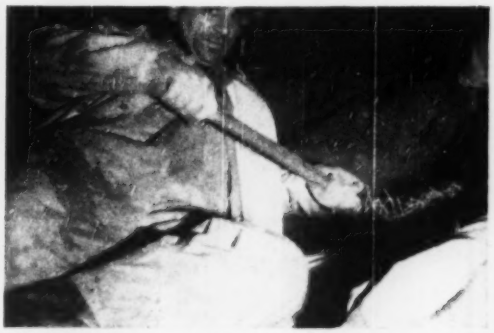


TOP DRIFT broadens out from pioneer drift, as man mucks for liner plates and for next arch-rib half, which will be supported temporarily by needle beam at top.

ARCH-RIB SPACER inserted for bolting, while man at left shoulders rib-half to correct position on steel-channel sill at springline. Bulkhead is adjacent to pioneer-drift entry.



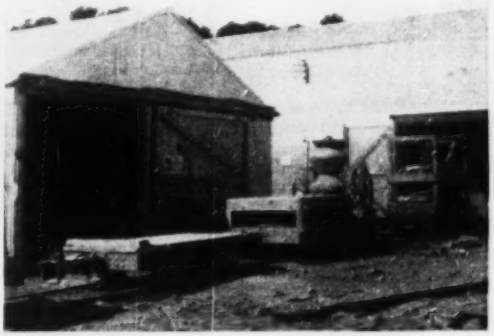
PIONEER DRIFT spearheaded work. Backward view at drift's entry shows spiling (arrows) that protected broadening-out. The spiling (tapered timbers driven over beams to act as horizontal sheetpiles) received main support from transverse timber frames.



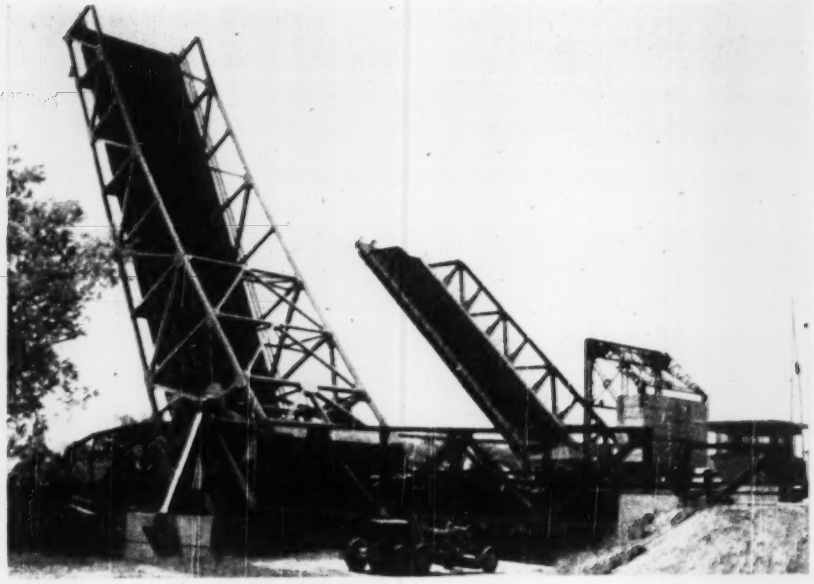
POLING BARS also protected men mining with axes and shovels at pioneer-drift face. Excelsior was kept handy to stem minor slides. Dirt was wheelbarrowed back to bench, dumped in front of mucker, which passed it to muck cars.

Above Ground, Contractors are Ready for Emergencies . . .

READY FOR BAD ROCK—Contractors keep complete sets of sills, ribs, spacers and lagging on flat cars at the portal, for quick action when engineers order support, but . . .



LIBERAL SEALING of shale rock saves its surface from characteristic quick weathering and strength-loss, makes steel support a minor factor in cost. Three-car rock-sealing train is shown.



NEW BASCULE BRIDGE (left) parallels existing span built in 1927. Design emphasized simplicity of detail as being more attractive architecturally and less costly to maintain.

Simplicity Distinguishes Bascule Span

W. J. Deady
Associate Bridge Engineer
California Division of Highways

ARCHITECTURAL, structural and mechanical simplicity were studiously designed into a recently completed California highway single-leaf, bascule bridge.

Architectural simplicity is evidenced in the design of the heavy concrete counterweight, structural simplicity shows up in the absence of overhead bracing on the approach spans. All phases of the operating equipment are indicative of the mechanical simplicity.

The new bridge crosses the San Joaquin River at Mossdale, on U. S. Highway 50—a principal artery between the San Francisco Bay area and the San Joaquin Valley. It parallels an existing single-leaf Strauss bascule built in 1927. The new bridge has a 150-ft bascule lift span and four 111-ft fixed spans. The old bridge also included a 124-ft lift span as well as a variety of approach spans.

Both bridges provide a clear channel opening of 88 ft between fenders. The roadway widths are 24 ft on the old bridge and 27 ft on the new. The old bridge was designed for an H 15 loading and the new for H 20 S 16.

• **Attractive design.** The California bridge department is attempting to make bridges look attractive without adding any appreciable cost. In bascule bridges, the heavy overhead concrete counterweight has historically been an ugly feature. But triangular holes through the counterweight, and curving it to fit the gear train, makes the mass of concrete an architectural asset instead of a liability.

Purpose of attention to attractive, clean-cut details is twofold. Driving hazards are reduced because driver distractions are lessened; maintenance costs are lowered. State engineers predict that maintenance costs on the new span will be significantly less than similar costs on the existing structure. Much of such a reduction is attributed to simpler details.

The holes give the counterweight the appearance of a Warren truss—this is the truss system used throughout the bridge. There is a reason for thus shaping the concrete for it is cast about a Warren truss that serves as the counterweight support and as the structural tie between the longitudinal trusses on the lift span.

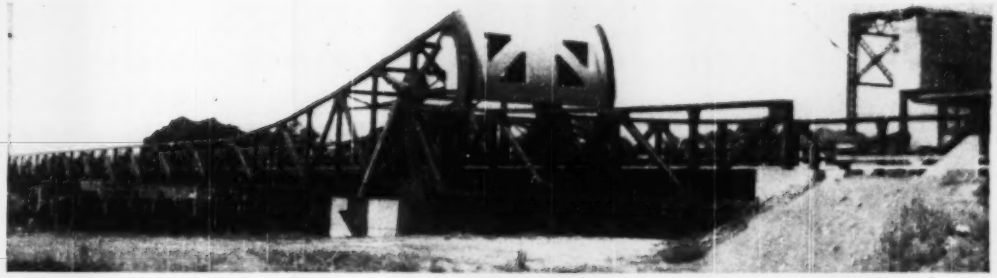
To make up for weight taken out by the triangles, pig iron ingots, stacked in recessed areas of the counterweight make up for weight taken out for the triangles, and help in final balancing of the span.

Design attention was also directed to reducing overhead bracing in the new bridge. Considerable difficulty has been experienced in California because of high-piled loads on trucks hitting portal struts and lateral braces of truss spans. Accordingly, at Mossdale, all overhead bracing was eliminated from the approach trusses. Some overhead framing is necessary in the bascule leaf, but this is kept to a minimum.

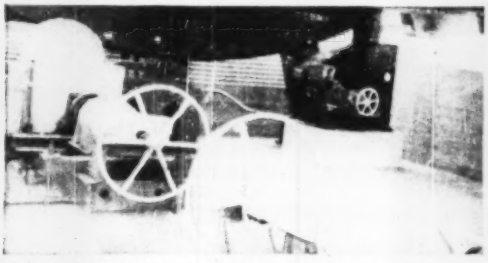
• **Well-balanced structure.** Of prime importance in bascule design is balance of the lift section to require minimum lifting effort. This has been so well accomplished in the new bridge that two men operating hand wheels can manually open the span if power fails.

The segmental gear rack is supported by enclosed steel box girders. These were filled with steel punchings and grouted to keep the steel from rattling. This helped provide weight in the short counterweight end of the lift span.

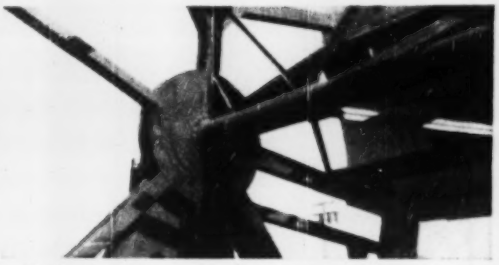
This good balance permits use of relatively low-powered mechanical lift



EVEN THE CONCRETE COUNTERWEIGHT—usually the ugliest part of a bascule span—was made to look attractive.



HAND WHEELS lift the movable span in case of power failure; jacks take load off main bearings when span is closed.



GUSSET PLATES were shrunk fit on the trunnion. Bearings are located on the outside of the span behind the plates.

ing equipment. The main drive mechanism is powered by two 15-hp, crane-type, wound rotor induction motors with built-in gear reduction and solenoid brake. Each motor drives an independent gear train that engages a segmental rack on one of the bascule trusses. Power is applied to the two motors simultaneously from a common control, but they are otherwise independent. The slip characteristics of these motors are such that the load is automatically divided between them.

The two motors are located under the roadway on the trunnion pier. The driving and braking mechanism are fully enclosed units for weather protection. For repair purposes, the entire assembly can be removed by loosening several clamping bolts.

To operate both bridges, a new operator's house was constructed between them on the east bank of the river. All controls are centralized at this location and both bridges are controlled entirely from this one point—except for one traffic gate. Control of the west gate of the new structure is provided outside of the control house at a point where both the gate and the traffic are more clearly visible.

Although controls are located at a common point and may be operated simultaneously, the mechanism of each bridge operates independently. The entire operating sequence for the two bridges is established by electrical equipment, and an interlocking control provides that all operations are carried out in the proper order. Only 1¼ min is required for the new span to travel from the fully-closed to the fully-opened position after the locks have been drawn.

• **Trunnion has two bearings**—The trunnion design of the new bridge is unique in that a single shaft requiring but two bearings is utilized. This shaft is 39 ft 9¼ in. long, weighs 23 tons, and has a maximum diameter of 25 in. A core hole 6 in. in dia was bored the full length of the shaft. Gusset plates were shrunk fit onto the shaft—an operation that required precise machine work.

The vertical reaction of the bascule span is supported on two cylindrical, roller-type, self-aligning anti-friction bearings, one at each end of the trunnion shaft. These roller bearings rank among the largest ever used on this type bridge, each bearing supporting an 800,000-lb load.

Thrust bearings are also provided to resist wind loads.

A portion of the load on the bearings is relieved when the bridge is in a closed position by two tail-lift jacks. Each of these jacks produces a positive reaction of 10,000 lb under each truss.

• **Open grid flooring**—Common practice indicates use of open grid flooring in the lift span. However, such flooring is used throughout the new bridge. This application is of an experimental nature aimed at decreasing the dead load of the deck system. It was accomplished without any increase in construction costs.

Rounded steel curbs and metal hand rail give the deck a light but sturdy appearance.

The new structure is located about 13 miles south of Stockton, Calif., and is a unit of an additional two-lane improvement that provides a four-lane highway between San Francisco and San Joaquin Valley points. Under the new traffic set-up, the old bridge now carries westbound traffic while the eastbound traffic uses the new bridge.

The new structure was built under two separate contracts, one for the substructure and one for the superstructure. Contractor on the substructure was Lord and Bishop, Sacramento, Calif. Superstructure contract was handled by Judson-Pacific Murphy Co., Emeryville, Calif. It, in turn, sublet the machinery work to Moore Drydock Co. and the electrical work to the Enterprise Electric Co., both of Oakland, Calif.

The bridge was designed and constructed by the bridge department of the California Division of Highways under the direction of F. W. Panhorst, assistant state highway engineer (bridges). The author was resident engineer on construction.

San Angelo Dam—Seven-Mile Earthfill

RIPRAP PLACEMENT by this crane, wielding an orange peel bucket, has gone as high as 800 cu yd a day. A bulldozer keeps its rock supply piled at the toe of the dam.

PLANNED TO STORE 391,500 acre-ft of water for parched West Texas, San Angelo Dam is now nearly 40 percent complete. This $18,500,000 project of the Corps of Engineers is on North Concho River, a tributary of the Colorado River of Texas.

When finished in 1951, the seven-mile long earth dam will form a 12,700-acre reservoir.

Work started in May, 1947, when the Fuller Construction Co. of Shreveport, La., began construction of a portion of the embankment. A second contract for constructing another section of embankment was awarded to the Hughes Construction Co. of Weslaco, Tex. At the present time Winston Brothers Co. and Taylor-Wheless Co. of Minneapolis, Minn., are engaged in completion of the rolled earth placement and building a service bridge and spillway; Nelan Bros. Construction Co. of Minneapolis, Minn., is constructing the concrete outlet works.

• **Outlet nearly finished**—The outlet works will consist primarily of a gated intake structure and two 18-ft dia discharge conduits through which water stored in the reservoir will be discharged. Low-flow outlets for discharge of conservation waters will consist of two valve-controlled 30-in. dia conduits. The discharge conduits, the lower portion of the intake structure and the stilling basin are near completion. The contractor now is constructing the control tower which will house the machinery for operating the slide gates.

In this concreting operations at the outlet works, the contractor uses a single-drum paving mixer. Concrete is emptied into a hopper skip and carried to the forms by elevator. Aggregates and cement are dry-batched at a nearby plant and transported to the mixer by truck.

• **Spillway concreting methods**—The concrete spillway section (three miles from the outlet works) requires larger quantities of concrete. Here a dual-drum paving mixer is used, and concrete is hoisted by crane in 1½-cu yd buckets to the point of placement. It is consolidated by internal electric vibrators. Finished surfaces of flat slabs are obtained by a vibratory reciprocating screed.

Vertical and sloping surfaces are water-cured for 14 days. A membrane curing compound is used on the horizontal finished surfaces. During freez-

ing weather, wood-burning salamanders were placed under canvas covers to prevent freezing of the concrete in the curing period.

Water for mixing and curing operations is obtained from the nearby North Concho River and is stored in 10,000-gal storage tanks.

• **The earthfill operation**—Construction of the rolled earth dam involves placing and compacting 11,461,000 cu yd of fill. Some 500,000 cu yd are being placed each month—a better-than-schedule average.

Various types of soils are going into the long embankment; the north end and center portion contain caliche; the south end is principally red bed fill. Materials come from borrow areas upstream and from the spillway excavation.

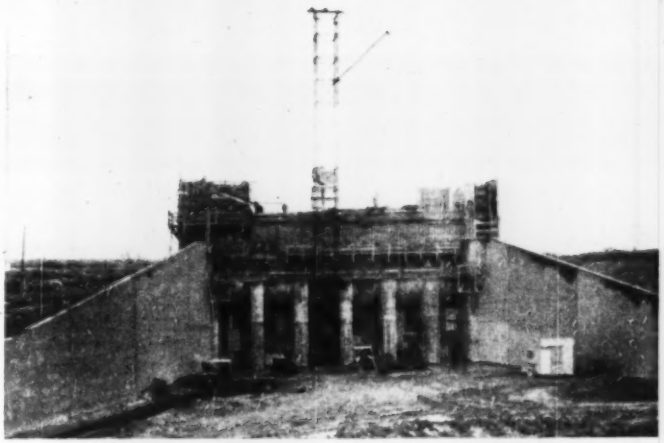
The contractor uses a dragline with a 3-cu yd bucket, a loader with a capacity of 800 cu yd per hour and dump trucks in earth moving operations. Fill is spread by bulldozers and motor graders to a 6-in. layer and is disk-plowed; water is added when necessary. Whenever possible, however, the soil is wetted in borrow pits before the placement operation with water from wells or the nearby river. Sheepsfoot rollers, exerting a pressure of 450 psi, are able to compact the fill in six passes.

Uniform density of the earth is obtained right up to the finished slopes by compacting the fill slightly beyond finished grade and then dressing it back to neat lines. An exceptionally uniform slope surface is obtained by dressing the side slopes with a cable drag pulled by two tractors, one operating on top of the fill and the other at its toe.

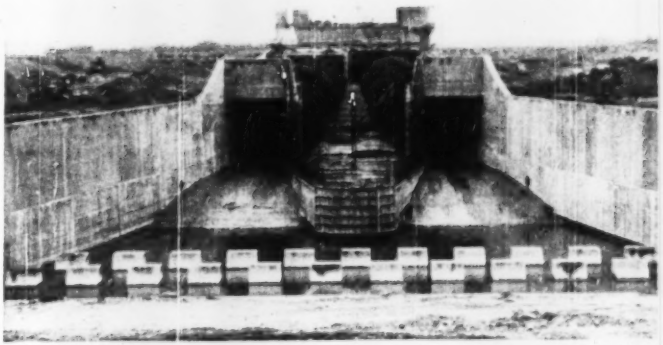
For night operations, twelve light towers, each equipped with generators and six 1,000-watt floodlights were erected. The towers are on skids and are movable as the contractor's work may demand.

Riprap is now being placed on completed upstream slopes of the embankment by cranes equipped with orange peel buckets. Rock is brought from near San Angelo in cable-dump trucks of 10-cu yd capacity. Downstream slopes are being grassed to protect the surfaces from erosion by wind and rain.

Lt. Col. Ellsworth L. Davis is district engineer of the Galveston District. The San Angelo project is under the immediate supervision of J. R. Simpson, resident engineer. Plans and specifications were prepared by the district's engineering division under H. R. Norman who has been succeeded by M. A. Dillingham; the construction division is under the direction of Kenneth Smith.



OUTLET WORKS above the dam will have six 7.5x14.5-ft sluice gates operated from a 145-ft control tower now being built. Two 18-ft dia. discharge conduits pierce the dam.



STILLING BASIN at downstream end of twin conduits is shown here nearly finished. Spillway for floodwaters is three miles away.

CABLE DUMP TRUCK bring in the rock for protection of the upstream slope. (Corps of Engineers photos)

Here's A Way—

To Tackle Pollution Abatement

THERE'S AN INTRIGUANT PROBLEM that plagues many a thinking sanitary man, when he starts out on a state-wide stream pollution cleanup:

The problem is one of economics—

Just who is going to use the water that you've cleaned up? For what? Is it worth all the money it's going to cost the community and industry?

In other words—do you need 100% cleanup, or will 50% do? Your answer will have a lot to do with the cost—and with the ease with which you sell your program and get it under way.

Most states have attacked this problem the easy way: Divide the state more or less arbitrarily into zones, set up quality standards for each zone, and see to it that everyone complies.

There's a couple of flaws in that system—number one being that you may get 100% purity for a water supply to a plant or other use that doesn't need water that pure—so somebody has spent more money than he needs to.

• **Different Approach**—In California—where a newly-created Water Pollution Control Board is now functioning—they think they have an answer.

They're dividing the state into regions according to major watersheds (ENR April 27, p 13). And within those regions, they'll do two things:

1. The potential of all bodies of water for natural purification—as well as pollution assimilation—will be weighed against the present and future uses of those waters.

2. They'll "administer" pollution abatement on a local level.

• **Policy set forth**—The basic concept of the State's Pollution Control Law—unique among pollution-regulating agencies—was enunciated in a policy statement by the state board at its first meeting last January. Among other things, the Board declared that its actions will be "directed to secure that 'degree of care in planning and operating works' for treatment and disposal of sewage and industrial wastes that will adequately protect public health and all beneficial uses of waters in this state—and at the same time permit legitimate planned useage of those waters for receiving suitably prepared wastes so that an orderly

TABLE I—SUGGESTED METHOD FOR ANALYSIS OF WASTE-DISPOSAL PROBLEMS

PART	OBJECTIVE	WASTE	RECEIVING WATER	BENEFICIAL USE
I	Compare public and private interest, the interest being to preserve beneficial uses of water involved	Step 1—Get the Facts: a. Necessity for disposal b. Assessed valuation of source of waste c. Number of people identified with waste source	Step 2—Determine or estimate zone of influence for these effects: a. Bacterial b. Biochemical c. Physical d. Chemical	Step 3—List beneficial uses and these data: a. Necessity for use b. Assessed valuation involved in use c. Number of people identified with use
II	Effects of discharge of wastes	Step 1—Record these data: a. Waste Volume (gpd) b. Bacterial, biochemical, physical and chemical characteristics of waste	Step 2—For receiving water intermixed with waste, list: a. Volume of flow (cfs) b. Bacterial, biochemical, physical and chemical characteristics before waste discharge c. Same characteristics in (b) after discharge	Step 3—For each beneficial use affected by waste, record: a. Volume water used (gpd) b. Optimum bacterial, biochemical, physical and chemical characteristics associated with beneficial use c. Maximum or limiting values of bacterial, biochemical, physical or chemical characteristics beyond which beneficial uses for practical purposes would be destroyed
III	Balance requirements of waste disposal against those of water use	Step 2—Compute degree and cost of treatment to maintain: a. Limiting values of quality characteristics required by each beneficial use b. Optimum values as under (a)	Step 3—From data Steps 1 and 2, Part III and relative values, Part I, determine by judgment: a. Uses for which optimum values of quality characteristics are to be maintained b. Uses to be kept between optimum and limiting values c. For uses in (b), the degree to which optimum values may be exceeded for best overall solution to the problem	Step 1—From Steps 2 and 3, Part II, tabulate: a. Beneficial uses destroyed by waste discharge b. Beneficial uses damaged but not destroyed by waste discharge
IV		Translate decisions in Step 3 Part IV into actual effluent requirements		

growth and expansion of cities and industries may be possible."

To balance out these engineering and economic objectives, a simple procedure for evaluating pollution problems effectively has been outlined by one of the Board's committees. The evaluating procedure is as yet tentative—especially as to water-quality requirements. And that's one reason that the procedure has been made available first to ENGINEERING NEWS-RECORD. The Board would like to receive full comments from interested parties before the procedure is adopted finally.

The method for analyzing waste-disposal problems aims to provide a "basis for arriving at appropriate requirements pertaining to a waste that will prevent pollution as defined in the statute." (ENR July 21, 1949 p. 29).

• **Analyzing waste problems**—Waste-problem studies will be divided into four part investigations under the headings of: Waste, receiving water and beneficial use (Table I). The parts:

I. Compare relative public and private interest in solving the waste problem, the interest being to preserve the beneficial uses of water involved.

II. Sum up effects of waste discharge.

III. Balance requirements of waste disposal against those of water use.

IV. Translate findings and decisions (III) into actual effluent requirements.

Each part consists of step-by-step procedures for collecting basic engineering, scientific and economic data, for placing it side by side for ready comparison, and for drawing logical conclusions from the comparisons.

An application example of this procedure—for analyzing Los Angeles' sewage problem and concluding that complete treatment is required and justified—is given in Table II. (This problem is, of course, only of historic interest because the Hyperion plant will be finished this year.)

Tentative water-quality requirements are tabulated in Table III. Significant in the proposed requirements is the specifying of both maximum and optimum (most favorable) standards. Most standards specify only maximum values.

• **Zoning not feasible**—Many states have erected water-pollution-control programs upon planned zoning of streams according to major uses (and abuses) of water. Within each zone, they have been established water-quality standards designed to be consistent with those uses.

This method, the Board concedes, has powerful advantages: It lets waste-producing agencies and activities know very definitely where they stand. And it furnishes a simple basis for administration of a control program.

But it has equally compelling objections, the Board feels, when applied to California. The objections:

1. Uses of waters within a zone are by no means uniform.

2. Effects of pollution are not uniformly dispersed throughout a zone from a source of pollution. They are restricted geographically.

3. A successful program must recognize that need for economical waste disposal is just as exacting as that for protection of water quality for beneficial uses. Lacking either, there can be no "sound development." Waste treatment always consists of a combination of artificial treatment plus

TABLE II—ANALYSIS OF LOS ANGELES' SEWAGE PROBLEM ON BASIS OF "POLLUTION"

	WASTE	RECEIVING WATER	BENEFICIAL USE
	SEWAGE FROM HYPERION OUTFALL	SANTA MONICA BAY	BATHING AND SWIMMING
PART I	Necessity: Huge volume of sewage requires it to be discharged into surface waters capable of diluting it so as to prevent septicity. Reclamation may substantially reduce average volume but not peak volume requirements. Assessed Valuation: L. A. City: $2,300,000,000 Number of people: 1,800,000	Zone of influence Bacterial effects Hermosa Beach to Santa Monica Biochemical effects Very limited Physical effects Hermosa Beach to Santa Monica Chemical effects None	Necessity: From standpoint of climate, accessibility, water currents, beach width and beach slope, this area is choice and impossible to duplicate elsewhere. Assessed Valuation: Hermosa Beach to Santa Monica: $129,000,000 Number of people: L. A. County (1.) 2,000,000
PART II	Volume of waste: 200 mgd Characteristics of waste: Mixed sewage and industrial waste from 2,000,000 people after screening only. Coliform: 100,000 + ml Suspended solids: 400 ppm	Vol. of "Flow": 1000 + 1 Dilution Characteristics w. o discharge: Coliform < 1 ml No visible solids or grease Characteristics after discharge: Coliform greater than 10 ml Visible solids and grease	Volume used: Entire stretch of Beach Optimum characteristics: Coliform less than 1 ml No visible solids or grease Limiting Values: Coliform 10 ml Traces of solids and grease
PART III	Cost to maintain limiting values: Primary treatment, chlorination and outfall: $30,000,000 Cost to maintain optimum values: High rate activated sludge Treatment, outfall and chlorination: $43,000,000	CONCLUSIONS Both discharge and use are necessary. Number of people involved in use justifies maintaining optimum conditions. Cost of maintaining optimum conditions is not out of line with assessed valuation of the city that must pay for treatment.	Beneficial use destroyed: Bathing and swimming and use of Beach from Hermosa Beach to Santa Monica Beneficial use damaged: Bathing and swimming for five miles north of Santa Monica and in Redondo Beach as well as in area described above.
PART IV		Provide complete treatment.	

utilization of natural purification resources. And economy of waste disposal requires that maximum emphasis be placed on the latter.

4. Perhaps the greatest limitation to a zoning program, the Board points out, is that it always tends to be fixed or permanent and does not lend itself to flexibility in reclaiming lost water quality or upgrading a degraded area.

• Reasons for individual analysis—For these reasons, members of the committee on water quality criteria rejected application of the zoning procedure to California's problems. They are of the firm conviction that a method for establishing requirements of waste disposal in each region must be followed that will consider these key points:

1. Total interest in a water pollution control program encompasses both economical waste disposal and preservation of beneficial uses of water.

2. Waste disposal requirements must recognize the zone of influence of wastes with respect to bacterial, biochemical, physical and chemical effects, and be only severe enough to protect some beneficial use of water (including simple aesthetic enjoyment) within such zones of influence.

3. Account must be taken of both present and future planned quality of a receiving water in setting forth requirements for disposal of a waste.

4. Requirements in all cases must be reached by logical analysis of all pertinent factors of a given problem. This is in sharp contrast to simple reference to an arbitrary general rule so that—when examined judicially in court—they will not be reversed.

5. The definition of pollution in the California law is restricted to impairments of water quality which unreasonably affect such waters for beneficial use. Some beneficial uses of water will suffer to some extent from disposal of wastes. To insure that such effects are not unreasonable, account must be taken of the fact that every beneficial user imposes two values on each of its water-quality requirements: An optimum value (most favorable degree) below which use is not damaged to any significant degree by pollution; and a maximum or limiting value above which beneficial use is to all practical purposes inhibited or destroyed (Table III).

6. Ground waters are of paramount importance in California, and damage to them is long-lasting if not permanent in nature. Surface waters, on the other hand, recover rapidly when the source of pollution is removed. Risks of accidental pollution of ground waters, therefore, cannot be tolerated.

For these reasons, the new method for evaluating waste problems individually has been drawn up.

• Regional boards—Initial decisions for abating pollution will be made by the regional boards. The state board will act as a "court of appeals," for these decisions. But it has authority to step into the local picture whenever a regional board fails to take appropriate action.

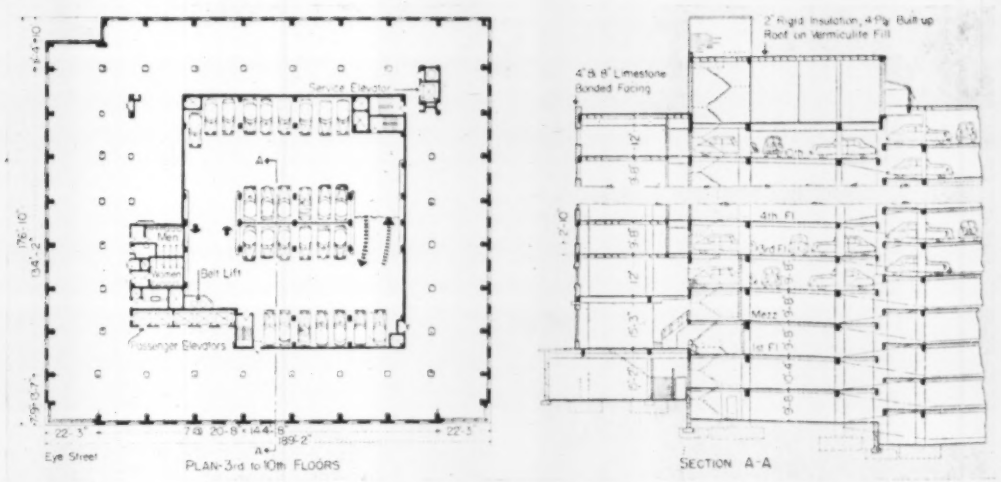
The evaluating procedure outlined above will, therefore, be utilized only in cases coming before the state board. Regional boards may employ it.

• Technical committee—The evaluating procedure and water-quality requirements is the work of a special committee. This group included A. M. Rawn, general manager and chief engineer of the Los Angeles County Sanitation Districts; G. F. Arnold, director, San Diego water department; Don McMillan, city manager, Pasadena; and Frank Stead, acting executive director of the Board.

TABLE III—TENTATIVE WATER-QUALITY REQUIREMENTS

	RECREATION				WILDLIFE PROPAGATION			IRRIGATION				INDUSTRIAL				AESTHETIC
USES	Domestic Water Supply	Shell Fish Culture	Bathing & Swimming (Fresh W.)	Bathing & Swimming (Salt W.)	Boating & Fishing	Fish (Fresh W.)	Fish (Salt W.)	Fowl (Refuge)	Truck Crops Vegetables	Citrus Fruits	Other Crops	Food Processing (Fresh W.)	Food Processing (Salt W.)	Cooling & Other (Fresh W.)	Cooling & Other (Salt W.)	Enjoyment
1. Bacterial																
Coliform Opt (per ml)	1.0	1.0	None	1.0	10	10	10	100	1.0	10	100	0.1	1.0	1.0	10	
Coliform Max (per ml)	50	5	1.0	10	100	100	100	1,000	10	100	100	1.0	1.0	10	100	
2. Organic																
BOD Opt (ppm)	None	5	5	5	10	10	10	10	...	...	...	None	1	5	5	20
BOD Max (ppm)	0.5	20	10	10	10	10	30	50	...	...	...	5	10	10	20	100
D. O. Opt (ppm)	5	5	5	5	5	5	5	5	...	...	...	5	5	3.0	3.0	5.0
D. O. Min (ppm)	2	2	2	2	2	1	2	2	...	...	...	1	1	1.0	1.0	1.0
Oil Opt (ppm)	None	None	None	None	None	None	None	None	None	None	None	None	None	5	5	None
Oil Max (ppm)	2	2	2	2	5	5	5	5	5	5	5	2	5	10	10	10
3. Reaction																
ph Opt	6.8	6.8	6.8	6.8		6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	4.0	4.0	...
	7.2	7.2	7.2	7.2		8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	10.0	10.0	
ph Critical	6.6	6.6	6.5	6.5		6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	4.0	4.0	
	8.0	8.0	8.6	8.6		8.5	8.5	8.5	9.0	9.0	9.0	9.0	9.0	10.0	10.0	
4. Physical																
Turbid Opt (ppm)	5	5	5	5	10	5	5	10	...	...	...	5	5			50
Turbid Max (ppm)	20	50	20	80	50	10	20	100	...	...	...	20	50			
Color Opt (ppm)	10	10	10	10	10	5	5	10	...	...	...	10	10	...		20
Color Max (ppm)	10	50	10	10	50	10	20	100	...	...	...	10	50			100
S. S. Opt (ppm)	10	10	50	50	-	10	10	50	...	...	...	10	10	50	50	
S. S. Max (ppm)	100	100	100	100		20	50	250	...	...	...	50	100	150	150	
Float S. Opt	None	None	None	None	None	None	None	Slight	...	...	...	None	None	None	None	Slight
Float S. Max	-	Cross	Cross	Cross	Cross	Cross	Cross	Cross	...	...	...	Slight	Slight	Slight	Slight	Cross
5. Chemical																
T. S. Opt (ppm)	500	...	...	...	...	1,000	...	...	500	500	500	500		1,000		...
T. S. Max (ppm)	1,500	...	...	...	...	5,000	...	...	1,500	1,500	2,000	1,500		1,500		...
Cl. Opt (ppm)	250	...	...	...	...	1,000	...	...	200	100	250	500	...			...
Cl. Max (ppm)	750	...	...	...	...	2,500	...	...	750	500	750	1,000	...			...
F. Opt (ppm)	0.5	1.0	...	...	...	...	...	...	5	1.0	...	...	...			...
F. Max (ppm)	1.5	...	...	...	...	...	...	...	5	...	...	...	...			...
Tox. Met. Opt (ppm)	None	...	0.1	0.5	...	0.5	0.5	...	0.1	...	...	None	None	...	...	...
Tox. Met. Max (ppm)	0.5	0.1	5	10	...	10	10	...	2.5	...	...	0.1	0.5	...	...	...
Phenol Opt (ppb)	1	1	5	50	1	1	5	5	5	...	...	1	5	...	...	...
Phenol Max (ppb)	5	10	50	1	10	1	5	25	20	...	...	10	50	...	...	...
Boron Opt (ppm)										0.5	1.0					
Boron Max (ppm)										1.0	5					
Sod. Ratio Opt (-)									35-50	35-50	35-50			90		
Sod. Ratio Max (-)									80	75	80			90		
Hardness Opt (ppm)	100													100		
Hardness Max (ppm)	250													500		
6. Temp. Max (deg)	60	70	65	65	...	60	60	...	...	...	...	...	...	...	...	...
7. Odor Max	N	N	N	N	M	M	M	M	O	O	O	M	M	O	O	O
8. Taste Max	N	N	N	D	...	M	M	M	...	...	...	M	M	...	...	...

N—Noticeable M—Marked D—Objectionable O—Obnoxious



GARAGE CORE of the 10-story Cafritz Building in Washington, D. C. will accommodate 450 autos on 27 levels.

"Park-at-Your-Desk" Office Building

PARKING will not be a problem for the tenants of the Cafritz Building, a 10-story, air-conditioned office building now going up in Washington, D. C. They will be able to drive their cars to the floors on which they work and park there.

About one third of the interior of the 189x177 ft structure has been allotted for this purpose. The garage core occupies 11,450 sq ft of the 33,-169 sq ft gross area of a typical floor. Office space is located along the perimeter of the building, which has windows on all four sides.

• **Why design was chosen**—Architect Le Roy E. Werner, of Washington, points to the following advantages of this design:

1. The building completely covers a large, nearly square lot, yet office space is located in the most desirable position—around the outside. The architect felt that, even with air conditioning, prospective tenants all wanted windows.

2. From a rental standpoint, the garage occupies the least desirable portion of the building. A light court in this space would be a waste of expensive real estate.

3. The garage will be mechanically ventilated but not heated or air conditioned, nor will it require any finish on walls, floors or ceiling.

4. The first floor and basement are rentable areas that might have been lost if parking space for all tenants had been provided on those levels.

5. The most suitable column spacing was selected for the garage and for the office areas. A garage in the lower stories might have required column spacing that would not fit office layout requirements.

• **Split-level garage**—Space will be available in the interior of the 10-story Cafritz Building for parking 450 automobiles on 27 levels. These levels are on either side of the center line of the core, those on one side being flush with the office floors and those on the other side being a half-story lower. They are connected by a two-way ramp, which has a maximum grade of less than 15% and a minimum width of 21 ft.

Tenants who do not wish to drive up the ramp will find attendants available to park their cars for them. Transients and visitors will also be accommodated, but they will park in the lower stories, for ready ingress and egress. Or attendants will take the cars to the sub-basement for washing or lubricating.

For those not driving up, five self-leveling, push-button elevators, with automatic control and signal system, will provide rapid transportation to all floors. Garage attendants will use a vertical belt lift.

• **Other design features**—The office portion of the building will feature fluorescent lighting, acoustical ceilings and under-floor electric conduits for flexible space use. A high-velocity air-conditioning system, with small-diameter risers, will serve outer areas, and a conventional duct system the interior areas. Compressors, cooling tower and fans will be in a penthouse.

The building has a reinforced concrete frame and floors. Cafritz Construction Co. is erecting the $7,000,000 structure, with Norman G. Kindness as superintendent of construction, and expects to finish it late this year. Beall & Le May, of Washington, were the structural engineers.

Parking garages planned

To relieve congestion, the N. Y. City traffic commission has announced the sites for five off-street parking garages and a parking field which the city hopes to build through a city parking authority. Garage sites are: 60th Street near the Queensboro Bridge; block bounded by Baxter, Worth, and Mulberry streets and Park Row; Fordham Road and Elm Place in the Bronx; near Brooklyn Civic Center; and the block bounded by Fulton, Henry and Middagh Streets in Brooklyn. The parking field would be bounded by the Long Island R.R., Liberty Ave., N. Y. Ave., and 160th Street in Queens.

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READER COMMENT

Tank-Bottom Treatment

Sir: In the issue of the ENGINEERING NEWS-RECORD, February 23rd, your article on "Steel Tank Farm a City Reservoir" gave the description of the unusual bottom treatment—unorthodox as far as standard flat bottom tank practice is concerned.

The Tropical Oil Co., Marketing Department, subsidiary of Standard Oil Co. (N. J.) has used this same system since 1947 on welded tanks.

This work was done by D. & S. Construction Co., of Wilmington, California, under the supervision of our Construction and Maintenance Section, on two 55,000-barrel welded cone roof tanks. The bottom and first ring were built on cribbing, the bottom scraped and painted with two coats of red lead and later with two coats of asphalt paint, similar to the coal tar enamel mentioned in your article. The tanks were tested and lowered on the sand cushion impregnated with Esso bunker fuel.

Our company has used this system of construction in riveted tank building for many years. Although it adds to your initial investment, it gives assurance in testing and adds life to the tank.

We would be interested to know how wooden roofs would reduce maintenance costs, as the system used must be very expensive and steel roofing, if properly painted, will in our opinion, last much longer than any wooden roofing material.

As this article mentioned this system as unorthodox, I am of the opinion that, to extend the life of tank, is worth the small addition to the initial investment and should be considered orthodox.

H. A. FELTER
Chief Engineer, Marketing Dept.
Tropical Oil Co., Colombia, S. A.

A "Supreme Court" of Engineers?

Sir: The Hoover Reorganization Plan has recommended the establishment of a so-called Board of Impartial Analysts to pass on non-major Public Works Projects. Recently Senator Joseph C. O'Mahoney of Wyoming, introduced an amendment to the omnibus Rivers and Harbors and Flood Control Bill, now pending in Congress, to establish such a Board. In each case, the Board members are to be appointed by the President. In fact, a temporary Board along the same lines has already been appointed by the President and is known as the Temporary Water Resources Policies Commission.

Under all these proposals, the members of this Board would be Presidential appointees and would be under pressure from the Executive, to say nothing, we daresay, of pressure from subordinate levels. We are thoroughly in accord with this general idea, but venture to carry it one step further. Here, it seems, is one of the few practical opportunities ever offered in Government to give top-level recognition to the Engineering profession similar to the ultimate in recognition open to the Legal Profession in Supreme Court appointments. Not only to remove the possibility of political pressures, but to establish a Board-Commission or call it what you will of unassailable reputation, character and ability, let the appointments be for life, for men of highest attainment in the Engineering profession.

The Board would review important matters in a judicial capacity not unlike that of the Interstate Commerce Commission and the Federal Communications Commission. If the country is to be deprived of the long established efficiency and competence of the Board of Engineers for Rivers and Harbors of the U. S. Corps of Engineers in the Civil Works Program, there should be some new agency of comparable stature and qualification to take its place.

Perhaps the term "Supreme Court" is a misnomer in this discussion. It at least reflects the stature, the standing and the comparative level within Government of the Board and the men we would choose for the task of coordinating the development of our water and land resources.

Under the arrangement we contemplate, members of the Board would be expected to submit their reports and findings to the Congress, both from a majority and minority standpoint.

Just as Congress holds the purse strings now, so would it have no excuse for approving unsound projects.

As to salary, we suggest a pay level in every way comparable to that of the Supreme Court.

This suggestion, it seems to us, would perform a two-fold task. It would rid our resources development programs of political hangers-on and theorists, and by placing responsibility therefor in the hands of the nation's top-notch engineering brains, it would give to the Engineering profession the

(Continued on page 48)

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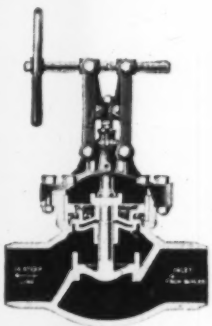

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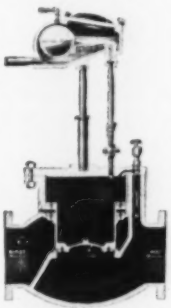

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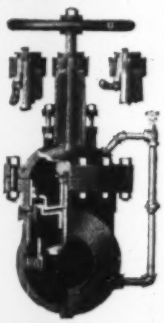

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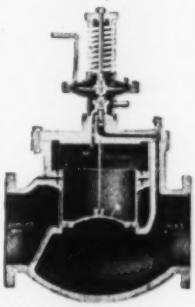
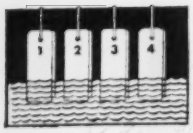


G-A Single Acting Altitude Valve, Globe Pattern



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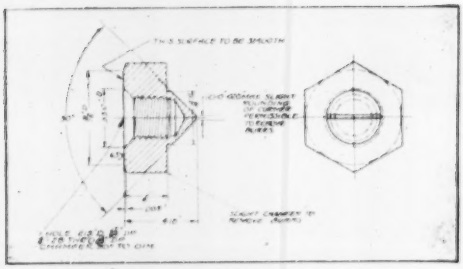

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(Continued from page 46)

same high recognition which for years, in Government, has been open to the Legal profession.

HUDSON BIGGY, *Chairman,*
Committee on Stream Sanitation
Cincinnati Chamber of Commerce
Cincinnati, Ohio

More Road Federal-Aid Unwise

Sir: Recent issues of the News-Record have reported some disagreement within the highway engineering profession concerning a proposed increase in the amount and the share of federal funds for the highway system. The problem needs further discussion.

The highway system is inadequate, in poor repair, and antiquated for the most part. The expenditure of many billions of dollars for its improvement is desirable and can be justified economically. However, asking the federal government for a large portion of these funds is not justifiable. The policy of so doing is simply avoiding the issue of taking the problem to the people. The majority of the voters are of the motor-vehicle era. They want good highways. They pay seemingly exorbitant tolls to use well planned, safe roads. They will support increases in gas taxes, license fees, paving assessments, bond issues, etc., at the state and local levels if they are acquainted with the facts. The job of the highway engineering profession is to acquaint the people with the problem and seek their support.

The policy of asking more and more money from the federal government, not only for highways but for all types of construction, must be one of the major incongruities of all time. The facts are:

1. The federal government is in debt to the extent of some 260 billion dollars.
2. Many state governments are free of debt, many actually have surpluses, the indebtedness of the remainder is inconsequential and their credit is good.
3. By and large, local governmental units are in as good financial condition as the states.

How can engineers and level-headed leaders in the construction, materials, and equipment businesses logically support a policy which advocates further federal subsidies when, in addition to the foregoing circumstances, the national government is now operating on a deficit budget? Asking the government may be easier than asking the people, but it is not wiser.

JOHN J. CUMMINS
Assistant Professor
State University of Iowa,
Iowa City, Ia.

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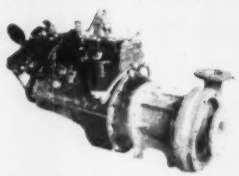

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DEVELOPMENTS ABROAD

SITE OF BIG FILDON PROJECT—The big new dam to take the place of the Fildon Weir on the Goulburn River, pictured above, will increase the capacity of the existing reservoir from 306,000 to 2,350,000 acre feet, while the present area of 320,000 acres of irrigated land will be increased fourfold.

U. S. engineers may bid on Australian project

American engineers are expected to play a part in the giant power and irrigation developments now under way in Australia. The "Down Under" continent has drawn up plans and appropriations have been authorized for the biggest public works project in that country's history. Australian authorities say that American know-how and equipment will be welcomed in the task ahead.

The Victorian State Rivers and Water Supply Commission has completed plans for the further conservation of water in the Goulburn Valley of that state, and is now calling for bids for the construction of a new earthen dam to be known as the Big Fildon.

• **To replace Fildon Weir**—The new dam, which will replace the existing Fildon Weir, will involve the placing of 13,000,000 cu yd of earth and rock fill. It will have a maximum height of 260 ft, and will call for approximately 300,000 cu yd of concrete work, outlet and control works, including a pondage weir about three miles below the dam. The Big Fildon will have a capacity of 2,350,000 acre feet, compared to the 306,000 acre feet of the existing weir at the same site.

The Goulburn River, across which the dam will be built, rises in the Great Divide, the range of mountains which bisects the state of Victoria into its northern and southern portions. Its source is 60 or 70 miles northeast of Melbourne, population 1,250,000, the state capital. In the rugged watershed country, the river, fed by fast flowing snow streams, runs in turn toward every point of the compass. Finally it makes a break west out of the hills at Fildon.

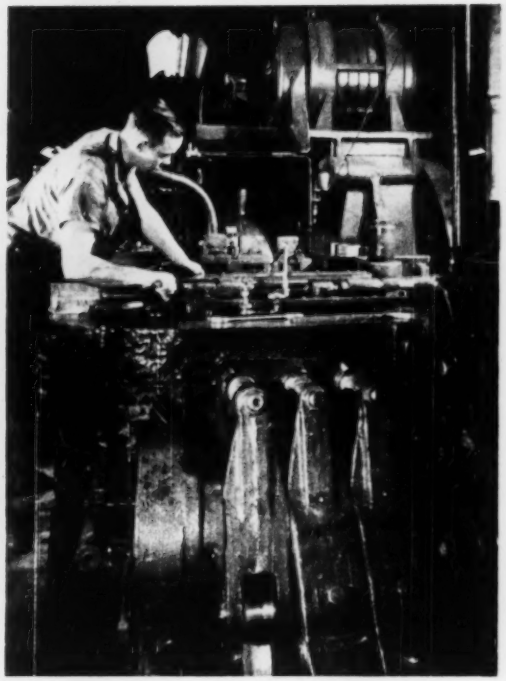
In the rich farming area below the present weir, farmers on small holdings produce millions of dollars worth of canning fruits, vegetables, fat lambs and dairy produce. Past and present developments have strained the water supply to a point where further settlement is practically impossible. When the new scheme is completed, double the existing acreage will be brought under irrigation and a more assured supply, even in the most drastic drought conditions, will be available to farmers.

• **Hydro-electric power**—The new dam will also be used for the generating of hydro-electric power. The new project is aimed to multiply present output many times over. Victoria is Australia's smallest and most densely populated state, and its rapidly expanding industries have placed a big drain on the state's power resources.

The Big Fildon is the latest development in the huge power grid now under construction along the whole east coast of Australia, from Queensland in the north to Victoria in the south. The mainspring of the whole scheme is the Snowy Mountains Hydro-Electric Scheme, the $450,000,000 federal government project on which work began last October.

Recently, Richard G. Casey, Federal Minister for National Development,

(Continued on page 53)



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Judd Barner operates a Lorain Power Shovel for the Dallas County Road Commission, Fordyce, Arkansas. Says Judd: "It is a tough little machine and I enjoy operating it."

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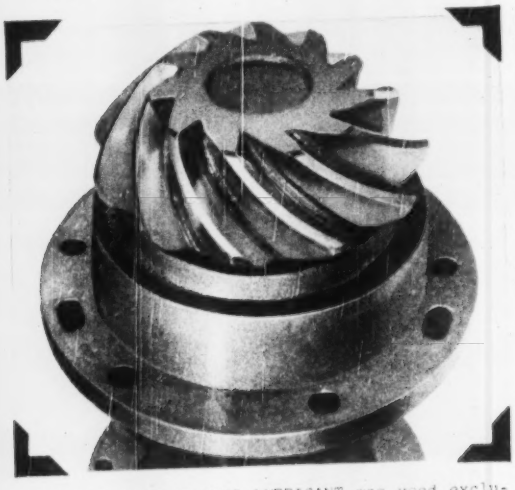
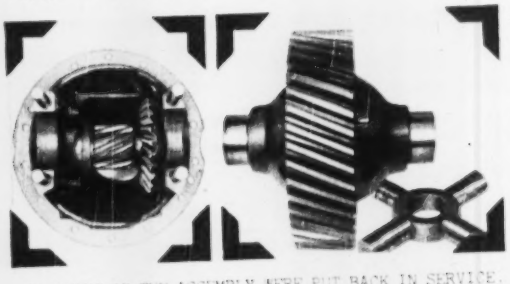
FIRM Illinois-California Express Co, L.A.

Hypoid gears in good condition after 332,711 miles!



RPM MULTI-SERVICE GEAR LUBRICANT was used exclusively in the final drive from which this hypoid pinion was pulled — 459,981 miles since it was new and 332,711 miles since last overhaul. As photo above indicates, none of the gears in the unit was worn enough to warrant replacement.



ALL PARTS OF THE ASSEMBLY WERE PUT BACK IN SERVICE. Note their excellent condition despite 332,711 miles of highway work in extremes of load and weather conditions. The rear end was only taken down because the truck it was in was temporarily tied up in the shop for engine adjustment and service.

How RPM Multi-Service Gear Lubricant prevents wear in hypoids

A. Contains a special compound that reacts chemically with metal and forms protective lubricating coating . . . resists rubbing action of hypoid gear teeth.

B. Withstands extreme temperatures and pressures . . . highly oxidation resistant —prevents excessive deposit formation.

C. Provides lubricant for integral bearings and other parts. Will not separate. Inhibitors resist rusting and stop foaming in gear cases.

REMARKS. This final drive was in a transport unit hauling average gross loads of 68,000 pounds between Los Angeles and Albuquerque, New Mexico. The route is through desert and mountains from below sea level to 7200 feet. Some grades rise 2000 feet in 10 miles. Weather temperatures range from sub-zero to 125° F. in this area.

The final drive was in service from 13,000 to 14,000 miles per month. The RPM Multi-Service Gear Lubricant was drained and a new fill put in about every 35,000 miles. RPM Multi-Service Gear Lubricant provides longer gear life in all hypoid sets, truck, passenger cars or other installations. It comes in several grades to meet all conditions.

RPM

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said that it was hoped that most of the capital needed for national projects would be subscribed by private enterprise, with a substantial part of it coming from the United States and Britain. Mr. Casey said: "We are very short of contractors to take on big jobs, and we would welcome overseas companies, particularly if they bring with them their own equipment, key personnel, and their own prefabricated homes for workers."

American engineers who are interested in placing bids for the Big Eildon project should address The Secretary, State Rivers and Water Supply Commission, 100-110 Exhibition Street, Melbourne, C. 1, Victoria, Australia, before June 30, 1950.

Drydock made in England for use on African lake

Parts of a complete 500-ton floating drydock of riveted steel construction have been fabricated in England and shipped out for erection at a new fleet maintenance base of Nyasaland Railways on Lake Nyasa in Africa, according to ENGINEERING, London.

Nyasaland Railways has two ships on the 350-mile long lake—one 450 tons and the other 250 tons—plus seven tugboats and other minor craft.

Completely cut and drilled in England, the dock arrived in sections small enough for convenient transport to be assembled by local labor. Four identical pontoons, fabricated of 0.26-in. steel plate, support sidewalls and give the dock a 160-ft 10-in. length and a 56-ft inside width. Deck, bottom, and side plating is 0.26 in. thick.

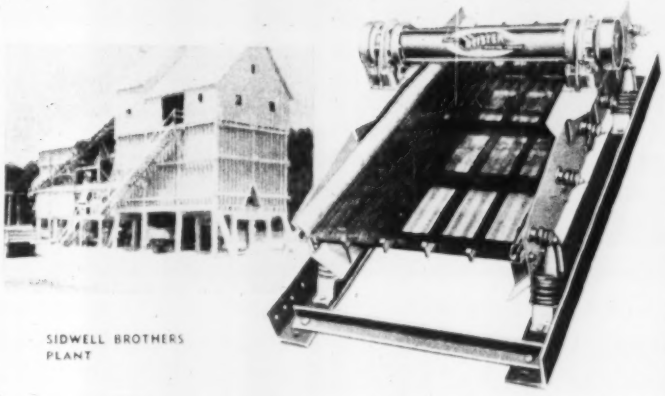
The starboard wall mounts the engine house and controls. A diesel generator set supplies power—10 kw, 220-v d-c—to a 7-in. centrifugal pump that can discharge about 1,000 gpm against a 12.9-ft head. The dock is said to be able to lift a 450-ton ship with a mean draft of 8 ft in five hours.

Head, Wrightson and Co. built the drydock sections at Teasdale Iron Works, Thornaby-on-Tees. Designers were the late E. H. Salmon of Clark and Standfield, London, and consultants to Nyasaland Railways, Livesey and Henderson, London.

Dutch visitors—To study the latest methods of building construction, in order to help in the rebuilding of their own country, a group of leading construction men from the Netherlands is now on tour in the United States, under the sponsorship of the Economic Cooperation Administration. In various places, the visitors are being assisted by members of the Associated General Contractors of America, the ASCE, and others.

1st

Production report on New Deister Ag-Lime Screen



SIDWELL BROTHERS PLANT

One year ago, we released one of our new Ag Lime Screens for production tests to Sidwell Brothers, Deavertown, Ohio. It performed so well that a second screen was added later.

Carl Sidwell sums up the exceptional all round performance of the Ag Lime Screen this way:

"As you know this is a very hard stone to screen. You really helped to solve our problem when you came out with this light weight, steep incline and high-speed screen. They are doing a very good job."

Both of the revolutionary Ag Lime Screens at Sidwell are equipped with 1/8" square opening cloth and .041" diameter wire. Screen Number One is fed 30 tons an hour, with 10 tons going through. Moisture content is 1½ to 4%. Largest particle in feed is ¼ inch.

Ag-Lime Screen Number Two receives 35 tons an hour, with 15 tons going through. Moisture content is ½ to 1½%. Screen cloths last an average of five months.

This is high-capacity handling and accurate sizing of damp sticky materials without blinding. The new Deister Ag-Lime is revolutionary: lighter in weight, operates on a far faster stroke cycle—especially designed to handle ag-lime and other damp fines. The experience of Sidwell Brothers is proof enough that for economical screening of agricultural limestone, you can't beat the new Deister Ag-Lime Screen. For particulars, write for Bulletin No. 51 today.

DEISTER SCREENS

DEISTER MACHINE COMPANY

FORT WAYNE 4, INDIANA

Recreation building at Culver, Oregon. Bogen & Jones, Bend, Ore., architects; Fred Kaiser, Madras, Ore., contractor.

Room for Play ...not much to pay

a story of permanent, clear span construction built for half the usual cost...

How to get a modern building at a genuine bargain was demonstrated in Culver, Oregon, where there was need for a substantial but low cost gymnasium and recreation center for school and community use.

The building shown above is the answer to that need. It is built around five Timber Structures glued laminated constant radius arches mounted on 12 foot buttresses with poured concrete curtain wall and entrance at each side. End walls are of frame construction.

With purlins to add rigidity, three-inch tongue-and-groove decking is applied directly to the arches. Shower and dressing rooms are in a partial basement. Floor is maple, of spring construction. Roof is mopped-on asphalt; knotty pine interior is natural finish.

Net result is a permanent, distinctive clear span building with 11,500 square feet of usable space which, including excavation, plumbing, wiring, heating and cafeteria kitchen, cost less than $6.00 a square foot!

Timber Structures, Inc., welcomes consultation on similar problems. See the Timber Structures office nearest you, and send coupon for factual booklet, "Timber Members".

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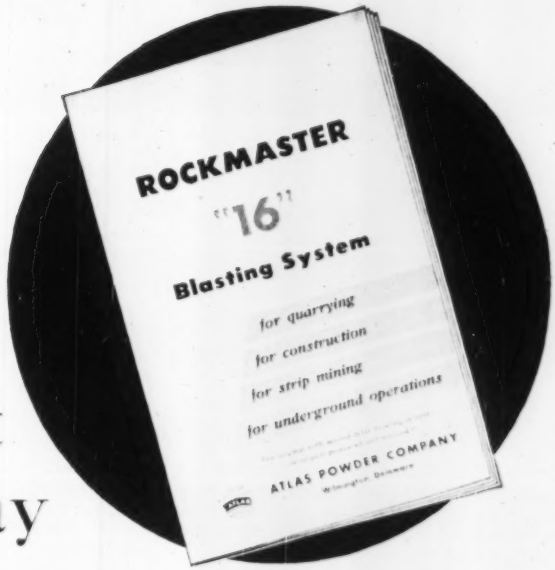
BRUSSELS SUBWAY—A Belgian project begun 40 years ago and interrupted by the devastations of two world wars, has been resumed and is scheduled to be completed next year. It is a train subway system in Brussels. It will connect the North Railway station with the Midi station and there will be four stations on the line. Shown is a portion of the work now being carried on in front of the St. Gudule Cathedral.—Wide World photo.

Foreign Briefs

Progress on Kiewa tunnel In less than three years, the Kiewa head-race tunnel in Victoria, Australia, has been driven to half of its ultimate length of 12,000 ft. It is part of the No. 4 development of the Kiewa hydro-electric project of the Victoria Electricity Commission, and will convey water from Clover Dam on the East Kiewa River to the pressure rise serving the power station of four 15,000-kw turbogenerators. Over most of its length the tunnel has a sectional area of 200 sq ft.

New Caledonia ore Rene G. Boyer, traffic representative of the Pan American World Airways, is in this country to stir up interest in the iron ore deposits in New Caledonia in the southwest Pacific. He says there are billions of tons there, the iron percentage averaging better than 50. The ore is at water edge and on the surface.

University center The Lord Mayor of London has announced plans for the construction of a university center for commonwealth and United States students in London. It would be a permanent memorial of Britain's gratitude for food gifts from overseas during the war. The estimated cost is $6,200,000.



In this booklet you may find the answer to your blasting problems!

WHETHER you blast rock, coal, or ore—on the surface or underground—it will pay you to read the ROCKMASTER "16" booklet.

Read how this blasting system, pioneered by Atlas, controls timing between holes to thousandths of a second, with *sixteen* delay detonators. Read how the proper control of loading, explosives, and timing controls breakage and throw as they never could be controlled before . . . cuts down noise and vibration . . . often means important savings in drilling and dynamite.

This ROCKMASTER "16" booklet includes diagrams of typical loading in quarries, strip pits, mines, and many types of construction. This valuable booklet is free to blasters. Write or phone the nearest Atlas office for your copy *now!*

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design

MAKES ALL THE DIFFERENCE IN WELDING TEES, TOO

When seamless drawn welding tees were introduced some 15 years ago, they represented a great advance over cut-and-welded intersections. Even so, they still had certain inherent weaknesses. Their design was unstable under high internal pressure and bulging resulted at the flat spots of the side walls. The relatively weak crotch area, carrying an unequal share of the load, usually gave way first in bursting tests. To compensate, tees were made excessively heavy.

Tube Turns research engineers developed a new welding tee design based on the sphere, nature's strongest form for resistance to internal pressure. This shape, with necessary modifications, became the basis for an entirely new welding tee design.

In the Tube-Turn barrel-type tee, the internal pressure load is carried largely in direct tension. And, in bursting tests involving the old and new design, it proved capable of withstanding 22% more pressure before yielding. It is at least 25% stronger than the code (ASA B16.9) requires, as evidenced by these test results on 6" tees:

Schedule	ASA B16.9 Required	BURSTING PRESSURE Test Minimum
40	4440 psi	5950 psi
80	6845 psi	8625 psi

Result of typical hydrostatic bursting test conducted in the Tube Turns research laboratory. The pipe itself split wide open under the terrific pressure applied; the new Tube Turns welding tee remained sound. Micrometer checks reveal no evidence of buckling or distortion.

FREE BOOKLET

Write for your free copy of Research, a booklet reporting results of cyclic tests being conducted by Tube Turns engineers on the fatigue life of piping assemblies. Well illustrated. Contains valuable information on relative fatigue life of welding elbows, miter bends, various types of flanges.

"Be Sure You See The Double tt"

TUBE TURNS, INC.

LOUISVILLE 1, KENTUCKY

MUNICIPAL AFFAIRS

AIR CONDITIONED OFFICES—A pressing need for modern office space in Los Angeles, the most rapidly growing metropolis, is to be partially met by the erection of these three 12-story, fully air-conditioned office buildings (with retail shops on a 465-ft frontage) along Wilshire Boulevard from Mariposa Ave. to Irola St., at an estimated cost of $12,000,000. A 2-story garage for 1,400 cars will be built at the rear of the property. Designed by Architect Claude Beelman, the 150-ft high buildings each will cover a plot of 100 x 150 ft. Supervision of construction will be by Fishman Realty & Construction Co., Inc., of New York. General contract has been awarded to C. E. Peck of Los Angeles. The first building is scheduled to be completed by May 1, 1951.

Propose regional plan for eastern Massachusetts

A regional plan for protection of streams, land reclamation and construction of parks, to benefit more than 150,000 residents in the Sudbury, Assabet and Concord River drainage area, has been filed with the Massachusetts Legislature by the Sudbury Valley Commission.

The effect would be to establish flood control, end pollution, relieve the mosquito nuisance, drain future farmland, and establish a state park and two game preserves. Nine towns most directly affected are: Concord, Wayland, Sudbury, Framingham, Natick, Lincoln, Carlisle, Bedford and Billerica. The proposed improvements extend over the entire drainage basin of 250,000 acres to Hopkinton on the south, west to Southboro, north to Lowell, and east to Lincoln and Weston.

The accompanying bill for flood control would authorize the State Department of Public Works to determine the best way to regulate the high and low water levels of the Concord and Sudbury rivers, by installations at North Billerica and plans for dredging and rock barrier removal.

The towns of Southboro, Ashland, Framingham, Wayland, Sudbury, Lincoln, Concord, Bedford, Billerica and Carlisle would be the location of a mosquito control project.

For the relief of pollution, the commission says that sewage from Framingham and Natick that now empties into the Sudbury River can be diverted to the south metropolitan sewer.

GSA grants planning loans

Loans totaling $385,000 for preparing plans on four projects estimated to cost $12,740,000 have been cleared by Jess Larson, General Services Administrator.

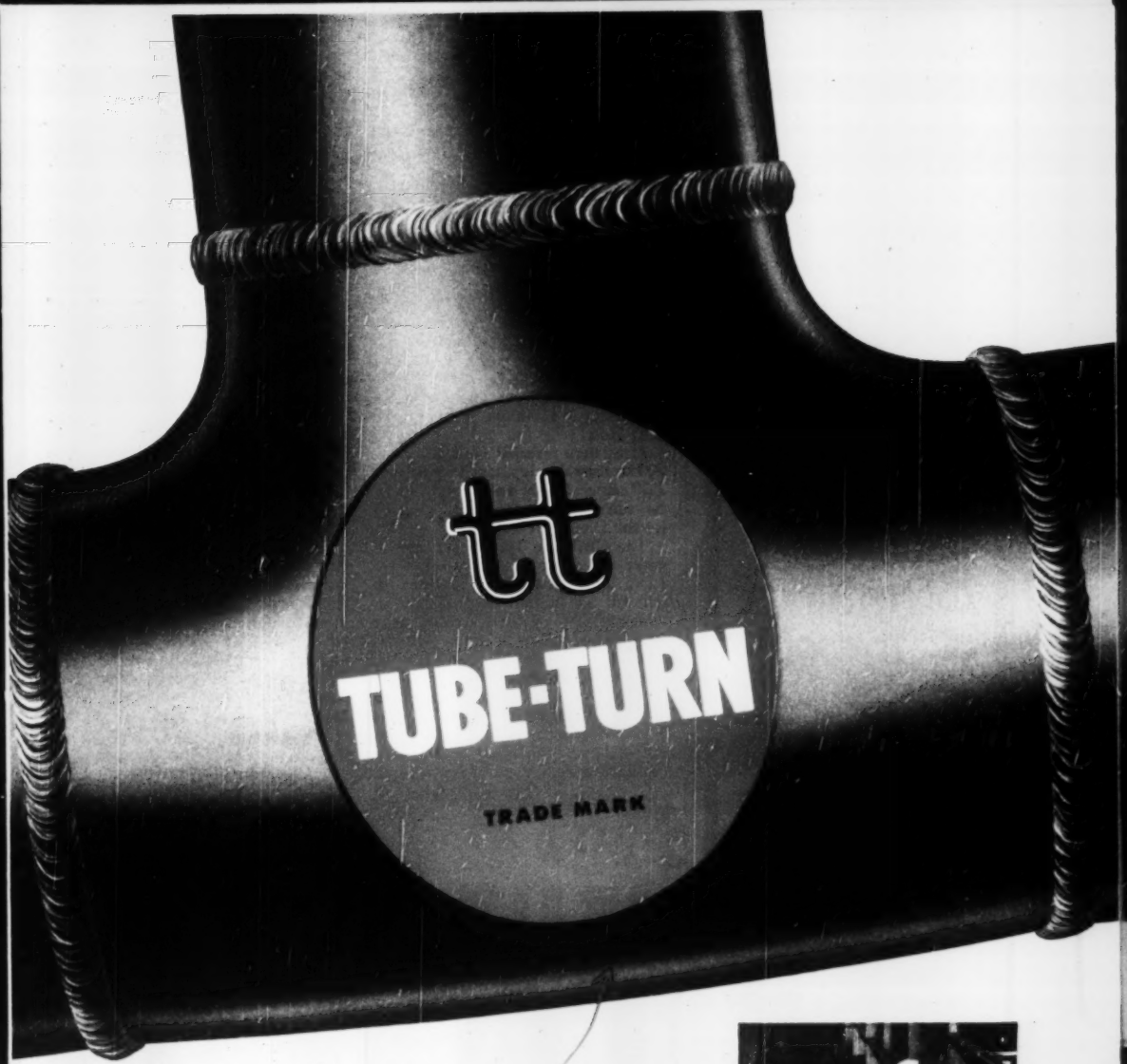
Loans totaling $245,000 were approved for two projects of the Bergen County, N. J., Sewer Authority, to finance plan preparation of a sanitary sewer system that will serve nine separate communities. Estimated construction cost is $7,925,000 (ENR Oct. 6, '49, p 18).

Another loan of $110,000 was approved for plan preparation of a 9-story annex to the Milwaukee, Wis., city hall. This project—10 percent of it to be allotted for a health center—is estimated to cost $3,759,500.

A loan of $30,000 also was approved for the sanitary district of Decatur, Ill., for plan preparation of additional sewage facilities to cost $1,059,000.

These loans were made under the second advance planning program enacted last fall (ENR Feb. 16, p 23).

(Continued on page 58)



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This salt-type wood preservative makes lumber and timber unpalatable to termites . . . kills decay causing fungi . . . gives a high degree of fire retardance. Copperized CZC does all this while leaving wood clean, paintable, odorless and safe to handle. Sound reasons why you should specify pressure-treatment with Du Pont Copperized CZC.

Full technical details on Copperized CZC available for the asking. Write: E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Dept., Wilmington 98, Delaware.

DU PONT

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

There's a building boom in New Orleans, La.

For a place that revels in antiquity, New Orleans may be adding to its reputation in a building boom that will soon attract wide attention.

Sparked by the clearing of slums and the filling up of an old canal to provide a site for a new union railroad station, the boom will be in full swing by mid-summer. Here's what happened in a recent week:

The first piles were driven for the $10,000,000 Claiborne Towers—a 17-story apartment building, the tallest in the city.

A bid-opening was announced for an 18-story, 400-room wing to the Jung Hotel.

Plans were revealed for a $30,000,000 housing development to consist of 2,600 single-family dwellings, the largest such development ever planned for the Crescent City.

The Claiborne Towers project will cover an entire block and contain 1,036 apartments, most of them to rent for $70 monthly. Shelby Construction Co., builders, reports that Raymond Concrete Pile Co. will use about 1,200 concrete piles 80 ft long. Jones & McLaughlin Steel Co. has the contract for fabrication and erection of the structural steel. Claiborne Towers, Inc. is owner and operator of the building, which was financed under Section 608 of the Housing Act.

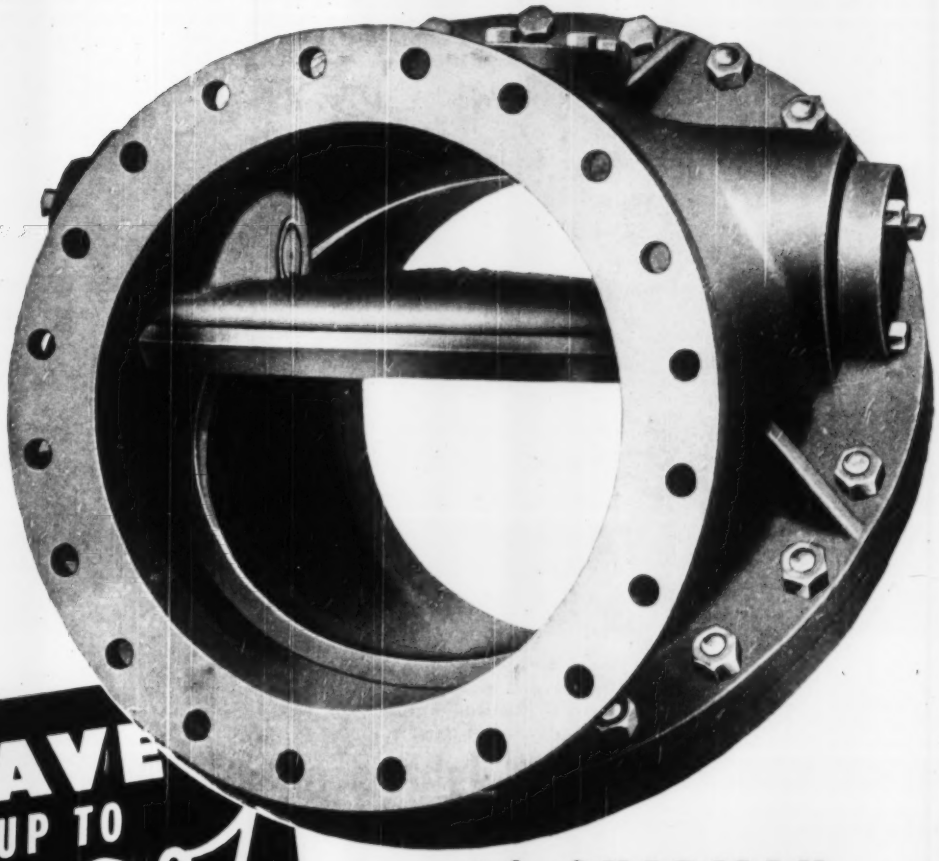
Nowland Van Powell, Memphis, Tenn., and Henry A. Eneching, New Orleans, are the architects.

There is good background for these somewhat out-of-the-ordinary news events of a single week. Building permits for the first three months of this year have been so high that it is freely predicted that the total for 1950 will double 1949's high record.

In addition to Claiborne Towers, eleven other multi-story apartments will be pushing skyward by July. Seven are already under construction, providing the city with its first new tall buildings since 1930. New Orleans is transforming its skyline at the same time that it is modernizing its front yard.

Chicago subways—Plans are being studied in Chicago for a $2,000,000 bond issue to finish the West and Northwest subway extensions. The 20-year bonds would be paid off by subway rentals from the Chicago Transit Authority. The bond issue is needed because CTA failed to pay the city compensation for the use of streets in 1949, according to Virgil E. Gunlock, commissioner of subways and superhighways. In 1948 CTA paid the city $1,053,000 in such compensation, but last year the revenues were insufficient. Plans to finance the subway extensions with a $25,000,000 bond issue, to be paid off with street use compensations, were abandoned in July, 1948.

MIAMI'S NEW STADIUM—His new $1,500,000 stadium, home of the Miami Sun Sox, is located at N. W. 10th Ave., and N. W. 23rd St., Miami, Fla. It is of concrete and steel construction with a cantilever roof so that no posts obstruct the view from any seat. The lighting system consists of 8 steel towers 140 ft high with a total of 612 reflectors. The seating capacity is: Permanent, 9,500; bleachers and temporary, 7,500. The designer was William Holman of Nashville, Tenn., and the contractor, Taylor Construction Co., Miami.—(Wide World Photo)



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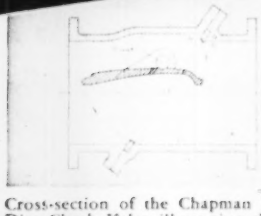
That's right! With Chapman Tilting-Disc Valves, head losses are 65% to 80% lower than for conventional type check valves.

But no wonder head losses are lower. Chapman Check Valves work with . . . not against . . . the stream. The balanced disc rides smoothly on the flow . . . lifts away easily in opening and closes quickly and quietly. There's no slamming to cause destructive pipe line stresses . . . minimum wear on seats, hinge pins and bearings.

All these features mean lower maintenance costs for you. So write *today* for additional information.



Cross-section of the Chapman Tilting Disc Check Valve illustrating the way that the balanced disc is supported on the pivot, with arrows showing the travel of the disc. A feature of the design is that the disc seat lifts away from the body seat when opening, and drops into contact when closing, with no sliding or wearing of the seats.

The Chapman Valve Mfg. Co.
INDIAN ORCHARD, MASSACHUSETTS

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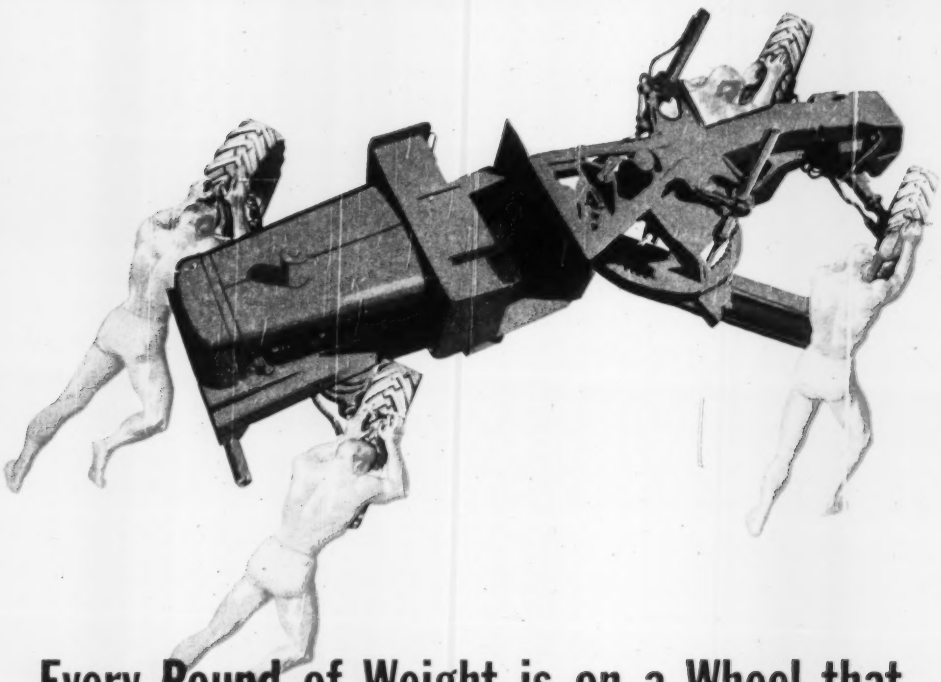

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EDUCATION and RESEARCH

Finlayson to retire

J. N. Finlayson, dean of the faculty of applied science at the University of British Columbia at Vancouver, will retire July 1.

Dean Finlayson went to UBC in 1936 from the University of Manitoba and has since guided the university's engineering faculty. He is being awarded an honorary degree of doctor of science. His career has combined business and academic activities, ranging from bridge construction to private consulting practice, professorships in three universities and chairmanship of arbitration proceedings in connection with development of hydroelectric power for Halifax, N. S.

From 1910 to 1915, he was employed as bridge designer for the Canadian Northern Railways, erecting 10 bridges between Vancouver and Kamloops. Later he joined the staff of Dalhousie University as professor of civil engineering while continuing practice as consulting engineer. In 1919 he was appointed chairman of the federal land drainage board, and the same year assumed a professorship at the University of Manitoba.

Pipeline network analyzer saves time and effort

An ingenius computer for taking the guesswork out of municipal water and gas systems and other networks of piplines or ducts has been developed at Cornell University by Prof. Malcolm S. McIlroy, who describes its function in the "Cornell Engineer" and the "Journal" of the American Water Works Association.

The device, called a "pipeline network analyzer," offers an electrical short-cut to specifications usually obtained by time-consuming calculation. The principle behind the analyzer is the analogy between fluids and their electrical counterparts, fluid flow being represented by electric current. Pressure loss in a pipeline is represented by voltage drop in a special type of resistor.

Simple controls permit pressures and rates of flow to be represented by proportional electrical quantities. The results are recorded on instrument scales indicating gallons per minute, feet of water, or other units.

Each pipline is simulated by a special type of resistor called a "fluister," consisting of a tungsten filament enclosed in an evacuated glass tube. Heavily loaded pipelines are indicated by bright fluistor filaments, underloaded lines by filaments that do not glow.

The efficiency of the device has been demonstrated in actual studies of the water distribution system on the Cornell campus and in the City of Winnipeg, Man. In one day, 14 studies of the Cornell system were conducted. By old methods, the work would have required two or three weeks.

The analyzer may be used for studies of flow of low-pressure gas in pipeline networks, and in problems involving compressible fluids, such as dry steam and high pressure natural gas, as well as for studies of duct systems in ventilation and air conditioning.

N. W. engineering research

A comprehensive survey of engineering research activities in the Pacific Northwest will be provided by the conferences of the Engineering College Research Council during the 1950 annual convention of the American Society for Engineering Education at the University of Washington, Seattle, June 19-20.

Three sessions will be devoted to the federal and industrial research activities of the region and the relation of these to the area's educational institutions.

Speakers will include S. L. Schultz, chief engineer for Bonneville Power Administration; Samuel J. Hutchinson, assistant regional director of the Fish and Wild Life Service; Don Walters, director of the Inland Empire Research Council; H. K. Benson, director of Research for the Lauck's Co.; W. W. Moyer, director of research at Crown Zellerbach Corp.

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Don Redfern, technical director of American Marietta Corp., S. E. Maddigan, director of the British Columbia Research Council, and Donald W. Finlay of the Seattle division, Boeing Airplane Co.

Principal speaker at the annual dinner of the council group will be Gerald A. Rosselot, director of the State Engineering Experiment Station at the Georgia Institute of Technology.

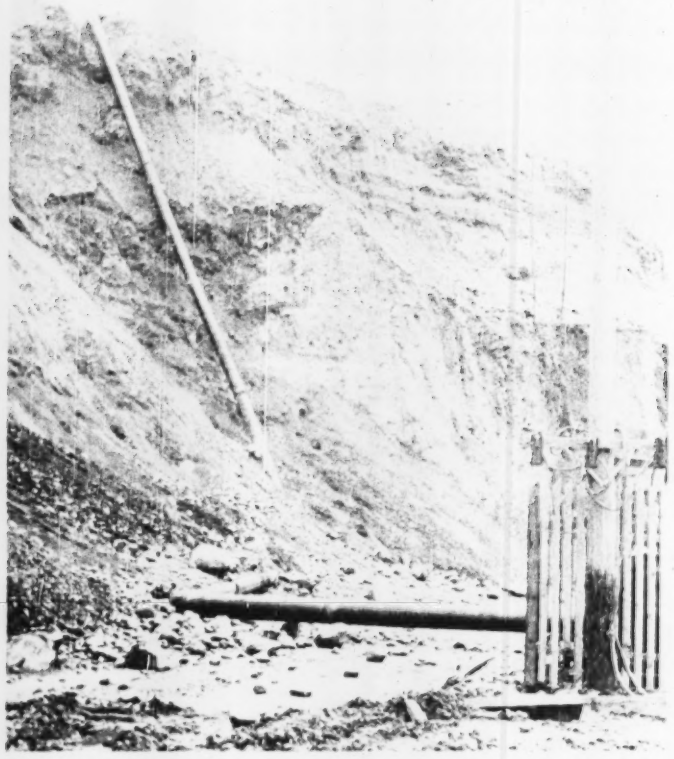
Educational Notes

Advanced structural theory—A graduate course in advanced structural theory is being offered by the Pennsylvania State College at its Harrisburg center. It is given for practicing engineers in that area. Instructor is J. P. Liebsch, bridge engineer of the Philadelphia Department of Public Works, who is planning the course around practical design techniques employed on the Pennsylvania Turnpike bridges.

Waterworks operators' school—The North Carolina Water Works Operators' School will be conducted in Chapel Hill June 4-9. Sponsored by the North Carolina Water Works Operators' Association with the North Carolina Section of the American Water Works Association, the school will be conducted by the Institute of Government in cooperation with the School of Public Health of the University of North Carolina. The school will be open to residents of neighboring states also.

Materials shrinkage—Federal Housing & Home Finance Agency has awarded a $10,000 contract to the Research Foundation of the University of Toledo, Ohio, to carry out research on shrinkage of building materials. Results will be published by the government for use of the construction industry and the public. The work will be done by members of the foundation and faculty, under supervision of John K. Sheldon, coordinator of housing research, and John B. Brandeberry, dean of the college of engineering.

Summer session—Chester A. Arents, assistant dean of engineering, has been named director of the 9-week summer session of the Illinois Institute of Technology, June 13-Aug. 18. More than 135 undergraduate courses for both undergraduate and graduate students will be offered in 17 fields of study in engineering, design, the natural sciences, and certain areas of the social sciences and humanities. Thirty-two courses in 12 fields will be offered for graduate students only.



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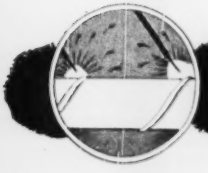
Naylor is the lightweight pipe with the backbone to stand up on construction jobs. No matter where you put it to work, you can depend on it—the Naylor structure won't let you down.

It gets its toughness from the continuous, electrically-welded lock seam spiral truss which extends the full length of the pipe. The lock seam carries the load. The weld acts principally as a seal. The result is strength and safety characteristics found in no other lightweight pipe.

It will pay you to get the full details on Naylor performance. Write for Catalog No. 11 today.



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Marion type 43-M excavators swing smoothly into every job

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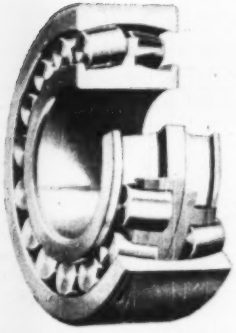

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The Marion Type 43-M excavator is designed for all-purpose work—as a one cubic-yard shovel, clamshell, dragline, backhoe, crane or pile driver. It's also designed to swing easily under load, with Torrington Spherical Roller Bearings on the center journal.

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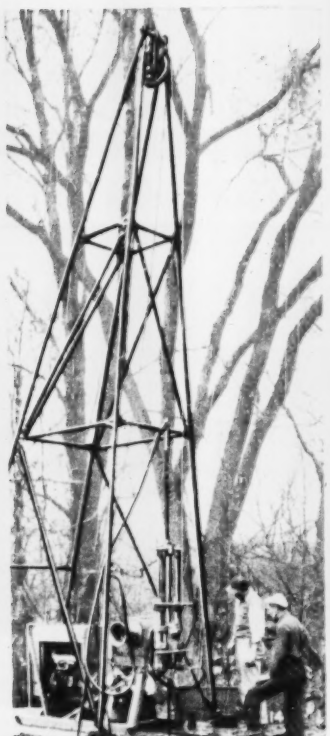
*Teredo

We call our new core drill the "Teredo" because it will out-bore any other machine of its size. This light, compact, portable core drill will recover cores up to 2½" in diameter and operate at depths to 600'. It can be mounted on drag skids, jeep, truck or trailer; and powered by air motor, electric motor, gasoline or diesel engine or truck take-off. It's simple, rugged and relatively inexpensive. Either mechanical screw feed or hydraulic feed can be furnished. Send for Bulletin 30



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MEN AND JOBS

Harry Keefe, graduate of the Notre Dame school of engineering, succeeds **John J. Mahoney** as building commissioner of Boston, Mass. He is a veteran and has been with the Thomas Worcester Co., engineering consultants, Boston.

Pennsylvania's Department of Health has announced the appointment of **John H. Gilliland**, of Meadville, Pa., as a junior sanitary engineer.

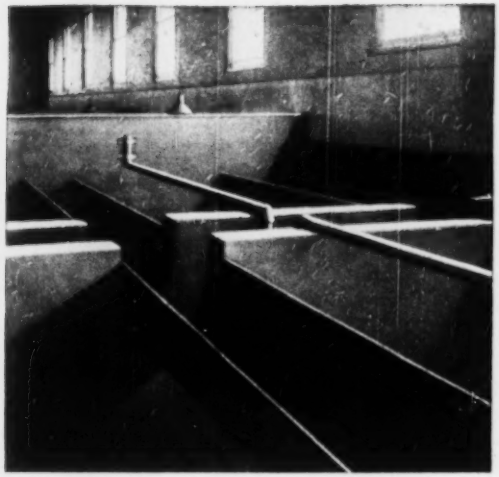
R. J. McMullin is the new manager of the Salt River Valley Water Users Association, Phoenix, Arizona. He moved up from superintendent of irrigation to fill a vacancy caused by the resignation of **O. L. Norman** as general manager. A graduate of the University of California, he has been with the Water Users Assoc. since 1948. He served with the armed forces. Before entering the service he was with

(Continued on page 67)

Prior to the beginning of the West Virginia highway construction season, a panel of state contractors and road commission engineers met to discuss ways and means of eliminating any prospective bottlenecks before actual work is started. Pictured above at the meetings are, front row, left to right: George W. McAlpin, state construction engineer; P. J. Walsh, executive secretary, W. Va., Contractors' Association; John C. Cobb, district engineer, U. S. Public Roads Administration. At the rear, left to right, Harry Radcliffe, administrative assistant, engineering, State Road Commission, and Leo Vecellio, president of the contractors.

Emergency construction of a 2,245-ft. tunnel to supply water to part of the Grand Valley reclamation project was launched through the contract signing shown here. Inking the document is L. N. McClellan, chief engineer of the Bureau of Reclamation. Flanking him are Floyd Shotwer, president of the Rhodes-Shotwer Construction Co., left, and Everett Seabury, vice-president, Grate-Callahan Construction Co. Standing, left to right, are W. E. Bloomgren, assistant chief engineer; W. H. Nabler, chief designing engineer, and Grant Bloodgood, chief construction engineer, all of the Bureau. The contract award followed by seven days the collapse of a tunnel of the old western Colorado project on March 9. (ENR March 30, page 22.)—Bureau of Reclamation photo.

West Pumping Station and Filtration Plant, Bureau of Water, Erie, Pa.



Water plant filter beds metallized with zinc to stop rust and corrosion.

Metallizing Checks Corrosion

at Bureau of Water, Erie, Pa.

Used As Far Back As 1930 To Protect Steel Surfaces Against Corrosion.

The Bureau of Water, Erie, Pa., started to use metallizing in 1930, when they sprayed zinc on all bolts and nuts used in the construction of a 72" dia. 8800 ft. intake. In 1932 a new filtration plant was placed in operation, but in only 18 months heavy corrosion was noted on the 110,000 gallon wash water tank interior. So they metallized the 32 ft. dia. x 19 ft. deep tank with .006" pure zinc. After six years no rusting had occurred, even though the tank interior is intermittently exposed to water and air.

Saved—Repair Costs and Nine Weeks' "Down" Time—Superintendent states that with ordinary methods of protection there would have been three periods of suspended service for the tank, each of them lasting for at least three weeks. "Now, however," he points out, "with no indications of a breakdown of the zinc coating, which has been in continuous operation for six years, we feel assured that the metallized surfaces will give many more years of perfect protection."

Other Jobs—This same user reports that metallizing has stopped corrosion on a number of other jobs done since the tank described above. These include steel filter troughs—some of which had already become so badly corroded that small holes had penetrated through the metal. These holes were filled with the sprayed metal at the time the coating was applied, thereby restoring to use troughs which otherwise would be considered worn out. They've also used metallizing to stop corrosion in boiler plant feed-water treating tanks, on steel ladders in basins and reservoirs, brace rods, sluice gates and, as user states, "all metal surfaces subject to rapid oxidation."

Further Information Available—Metallizing may help solve your corrosion problems. For further information, or the name of your nearest metallizing contractor, write

FREE BULLETIN. Bulletin 62—"Stop Corrosion with Metallizing"—pictures many different types of jobs, such as bridges, structural steel, barges, dam gates, includes spray test and life expectancy charts.

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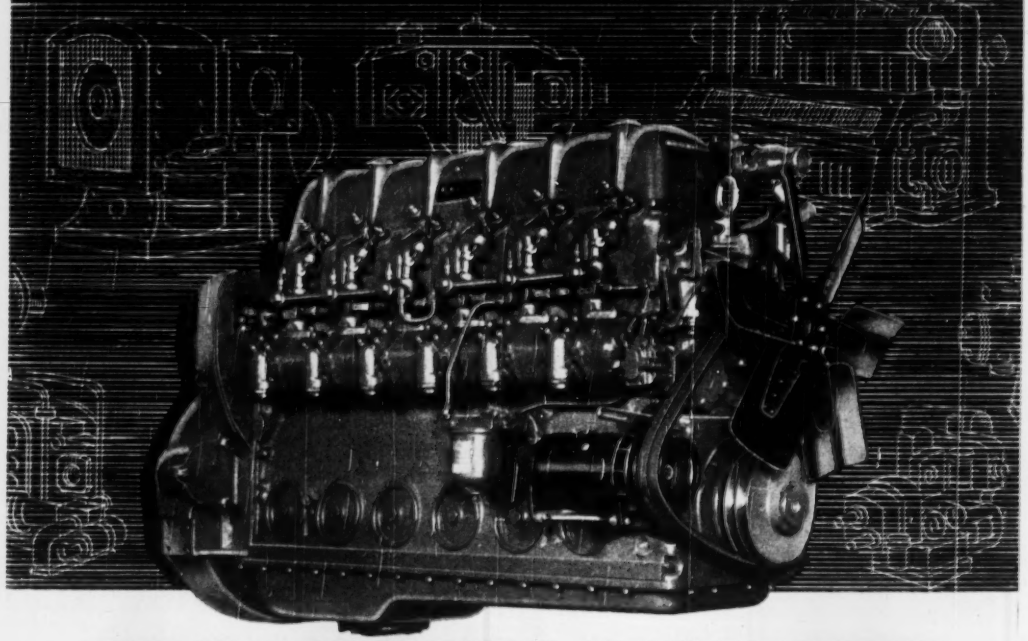

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the California Edison Company.

Carl J. Bernhardt, district sanitary engineer of the New York State Health Department in Jamestown for 12 years, has been named regional sanitary engineer in the Buffalo area, succeeding **Ralph D. Bates,** transferred to Albany to become chief of the sewage and waste section of the Bureau of Environmental Sanitation.

P. P. Greenwood retired recently as chief inspecting engineer of the Panama Canal after 37 years of government service.

M. D. Stewart, city engineer of Sudbury, Ont., has resigned.

S. C. Austin has been named assistant executive secretary of the Carolinas Branch, AGC. He will be in charge of the highway and heavy contractors divisions. He is a graduate in civil engineering, University of North Carolina, 1921. He has resigned as equipment engineer of the Highway Commission to join the AGC.

First Lt. William P. Gardiner has replaced **Capt. J. T. Wren** as executive officer of the Little Rock, Ark., district of Army Corps of Engineers. Captain Wren has been ordered to Japan. Gardiner is a West Pointer.

Wilfred Sykes, chairman of the board of Inland Steel Co., has been appointed a member of the Chicago Housing Authority by Mayor Martin Kennelly for a 5-year term. He was this year's winner of the Washington Award for outstanding performance in engineering.

Stanley E. Sporseen, civil engineer with the Portland, Ore., district, Corps of Engineers, has been loaned to the Venezuelan government for one year to assist in planning hydroelectric and irrigation dams. He has been with the corps for 15 years. When his mission is finished he will return to his Portland position.

Joseph M. Dearborn, Bridgeport, Conn., has been named city planning engineer to succeed **Robert H. Canfield** who retires because of ill health after 12 years. Mr. Dearborn, geodetic engineer in the city engineer's department, has been consultant to the City Planning Commission for two and one-half years.

Grady E. Lee, a civil engineer in the city planning commission of Atlanta, Ga., has resigned to become a project planner for the U. S. Public Housing Administration.

Roger D. Lee has been appointed hydraulic engineer of the Western Massachusetts Electric Co., at Turners Falls, succeeding **Herbert A. Moody,** retired. He is a New York University graduate formerly with the U. S. Engineer Offices in flood control, and during the late war in airfield drainage design. He also worked for the New York City Board of Water Supply on hydraulic model studies and in heavy construction. He joined Western Massachusetts in 1946 as assistant to Mr. Moody.

Marvin R. Springer, head of Harland Bartholomew & Associates of St. Louis, Mo., city planning firm, has been made city plan engineer of Dallas, Tex., succeeding **E. A. Wood,** made head of a new zoning enforcement department in Dallas. Springer was educated at Iowa State College and has supervised the preparation of master plans for many cities, including Dallas; Schenectady, N. Y.; Topeka, Kan.; and Battle Creek, Mich.

John C. Walker, division engineer of the eighth division of the North Carolina State Highway & Public Works Commission, at North Wilkesboro, has resigned to become city manager of Asheville, N. C. He has been with the commission for 25 years and was formerly division engineer of the tenth division, at Asheville, N. C.

Following the completion of the contract of **E. O. Mills** as consultant of the Toledo-Lucas County Plan Commissions, the city group has reorganized its staff, with **Ellick Maslan,** plan commission director, who had offered his resignation to take a position with Chicago housing authorities, being asked to remain with the Toledo plan bodies. The city group voted to put Mr. Maslan in complete charge of the staff, authority heretofore having been

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2. Explains business methods that make home building more profitable. Gives the business "know-how" needed to make a profit with minimum risk . . . a practical understanding of . . . the factors that determine . . . and the benefit of production . . . knowledge based on the experience of other builders. From preparing a . . . plan step by step to selling the finished building, everything is discussed. By B. R. Johnstone, Carnegie Institute of Technology, and C. F. Koerp, Wm. Foerp and Sons. 289 pages, 5 1/2 x 8, $4.00.

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PLAIN CONCRETE

4. This new third edition brings you modern methods in producing and using concrete. Every important phase of concrete technology, preparing specifications, supervising construction, and testing concrete and concrete materials is fully covered. Includes best practices in proportioning, mixing, placing, finishing and curing concrete. By E. E. Bauer, U. of Illinois. 341 pages, 6 x 9, $5.00.

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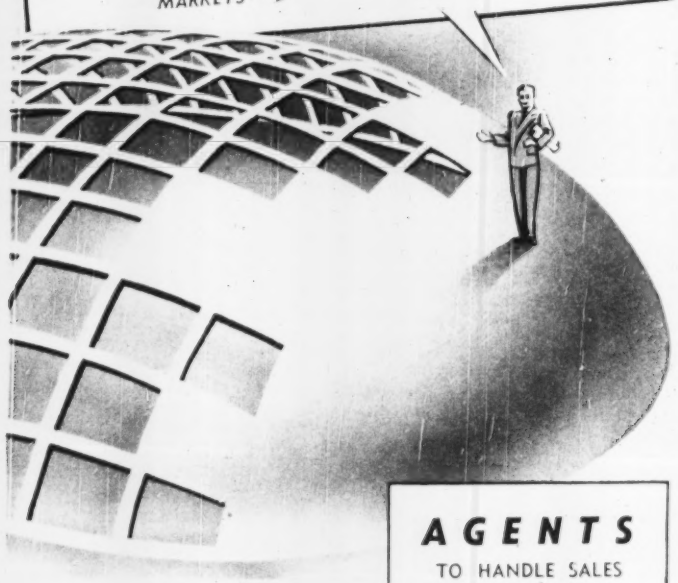

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ALUMINIUM SINGLE SPAN LIGHT WEIGHT ROOF

Available in diameters up to 600 feet, this new design eliminates the need for any internal supporting columns. Its light weight effects considerable saving in foundation costs and erection is simple and rapid. It can be embodied in rectangular or other layouts, and is competitive in cost with other construction methods. The roof cannot spark, and is therefore ideal for oil storage tanks. A complete 30 ft diameter roof can be carried on one five ton truck.

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divided between the director's post and the chief planner, Lloyd Keefe.

O. L. Norman, manager of the Salt River Valley Water Users Association at Phoenix, Ariz., since 1947, has resigned, effective June 1. During Norman's tenure as general manager the association instigated a vigorous reconstruction and improvement program to conserve water and improve electrical distribution.

John C. Page, retired commissioner of the Bureau of Reclamation has received the Department of Interior's highest honor, the Distinguished Service Award. He was commissioner from 1937 to 1945, and a bureau consulting engineer until 1947. The earlier part of his 36 years of bureau service were spent on the Grand Valley and Boulder Canyon projects.

Ivar Van Akkeren, a graduate of the University of Wisconsin is city engineer of Beaver Dam, Wis.

Robert F. Coleman, Jr., assistant city engineer at Wilmington, N. C., since 1947, has been named acting city engineer, succeeding **Henry M. von Oesen,** resigned to enter private business, and Ward Andrews, of the City Engineering Department staff, has been named assistant city engineer. Coleman holds a B.S. in civil engineering, a B.S. in sanitary engineering, and a M.S. in sanitary engineering from North Carolina State College, where he was an instructor in materials testing and surveying from 1940 to 1942. He served in the Navy from July, 1942, to February, 1946, while he took a course in naval architecture at Massachusetts Institute of Technology and he served for three years as assistant design superintendent at the Naval Shipyard at Brooklyn.

Benjamin Schwartz, civil engineer with the New York State Department of Public Works, has been appointed director of public works of Jamestown, N. Y., succeeding **Charles J. Straudburg,** retired. **Lawrence A. Fletcher,** who has been serving as acting director of the department, will continue as assistant director under Mr. Schwartz.

Jerome H. Fettig, Bureau of Reclamation engineer and chief of the development office on the Cachuma Dam project, Santa Barbara, Calif., has been awarded an Interior Department citation for meritorious service for his investigation and planning of the $30,000,000 Cachuma project. He is a veteran of 29 years bureau service.

(Continued on page 71)

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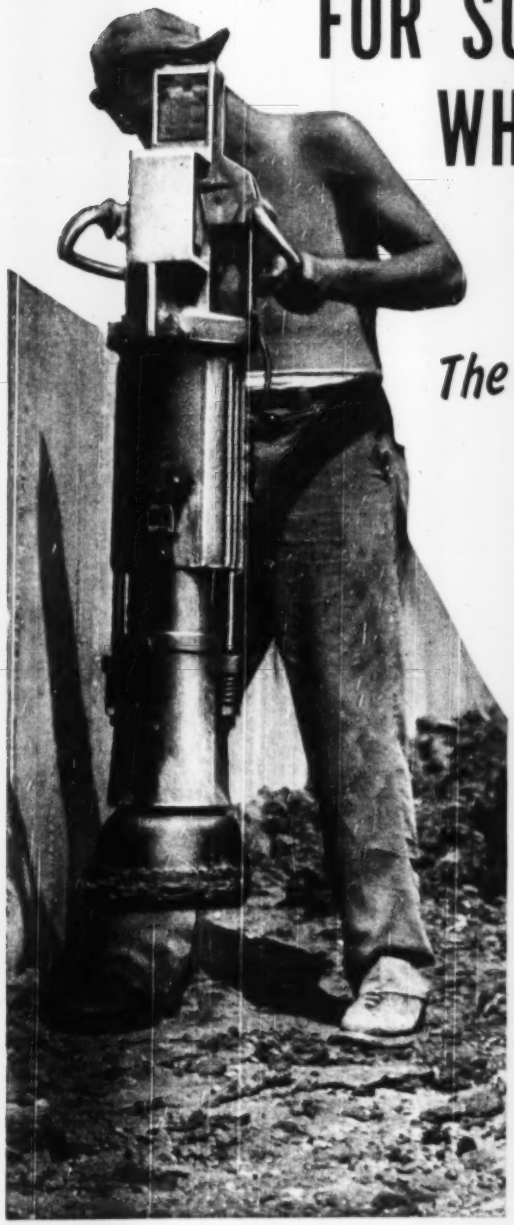
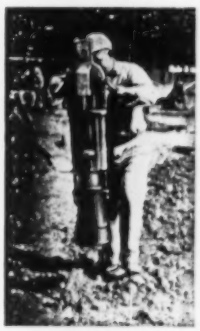
The Barco Pegson Rammer



This self-contained, portable rammer is specially adaptable to tamping close to abutments and other wall structures, in narrow ditches and trenches, thus eliminating troublesome settlement areas. Actual field tests, certified by Government agencies, have proved that one man using the Barco can do *the work of five* who use conventional equipment! This economical machine is easy to operate—no lifting, no strain, no vibration. A slight tilt on the handle will "walk" the Barco wherever you want it to go. Don't tie up your funds in heavy equipment—order Barco today. Write for free demonstration or catalog to Barco Manufacturing Co., 1814F Winnemac Avenue, Chicago 40, Ill.



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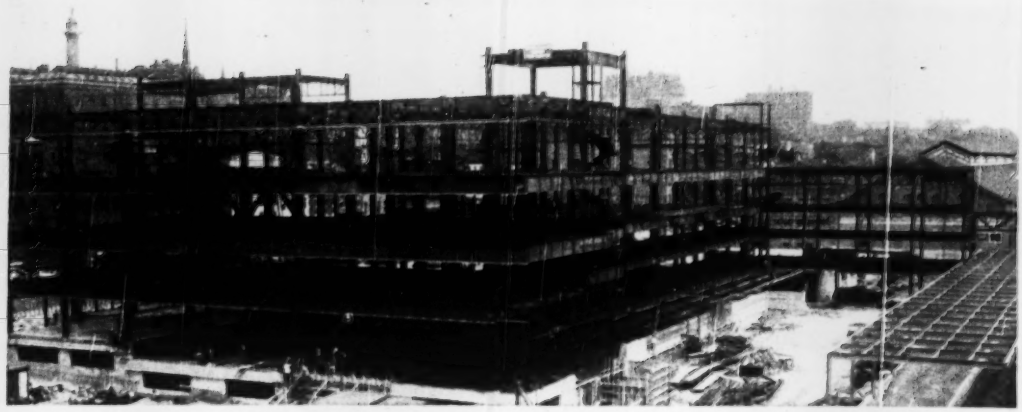

Fig. 1. Framework partially complete for the 5-story plant of Baltimore Sun, Baltimore, Md.
Architects: Palmer, Fisher, Williams and Nes;
Consulting Engineer: Van Rensselaer P. Saxe; General Contractor: George A. Fuller Co.

By VAN RENSSELAER P. SAXE
Consulting Engineer
Baltimore, Md.

A SAVING of $68,522 has resulted from the adoption of welded design for the publishing plant of the Baltimore Sun and Evening Sun shown in Fig. 1. Structural weight was cut by over 7%. A sizable amount of money was saved also on concrete and form work, as well as on reduced building height made possible by continuous beam design involving shallower structural members.

Typical framework connections illustrating the simple details for field erection are shown in Figures 2—3. Beams are positioned on erection seats or clips and then field-welded with Lincoln's "Fleetweld 5" electrodes using 400 ampere Lincoln "Shield-Arc" motor driven arc welders. In the design of frame members, bevel cuts for connections were so planned as to make maximum use of fast, easy downhand welding.

The quotation of the low bidder for riveted construction was $551,508. The actual cost of the welded frame was $482,986. This accounted for the $68,522 saving in the structure.

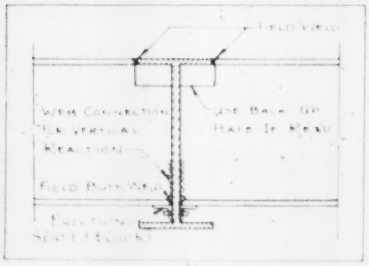

Fig. 2. *Typical beam to girder connection.*

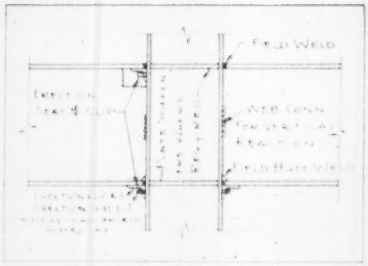

Fig. 3. *Typical beam to column connection.*

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LINCOLN

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Ivan A. Bickelhaupt, captain, civil engineering Corps, U. S. Navy, now on inactive status, has joined John W. Harris Associates, Inc., builders, of New York and Chicago, as Washington representative. Prior to his return to civilian life in 1946, Captain Bickelhaupt was public works officer in charge of construction for the Fifth Naval District. In May, 1941, he was sent to the British Isles to construct a naval seaplane base in Northern Ireland. Later he spent 15 months as engineering and construction officer on the staff of the Alaskan Sector Commander in charge of all naval construction in that area. He also directed construction of the Marine Corps base at Cherry Point, N. C.

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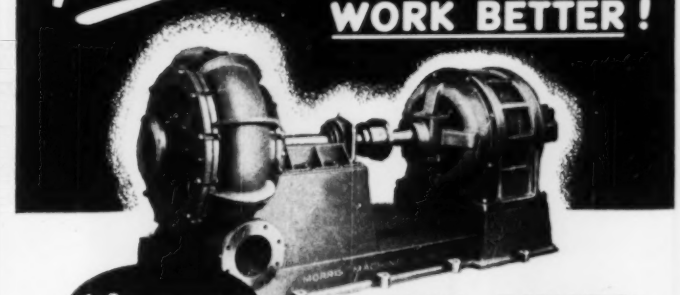

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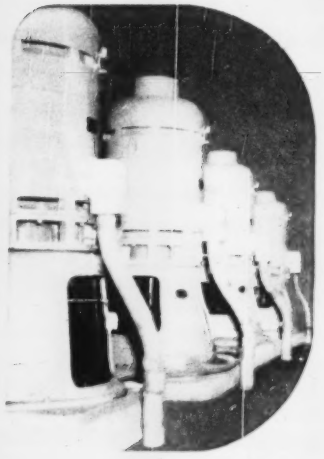

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ELECTIONS AND ACTIVITIES

James R. Price, Lafayette, Ind., president of National Homes Corp., has been elected president of the Prefabricated Home Manufacturers Institute, succeeding Hart Anderson, Minneapolis, vice president of Page & Hill Homes, Inc.

Guy Martin, of Albuquerque, has been elected president of the New Mexico Society of Professional Engineers. Charles E. Barnhart, of Albuquerque, was elected first vice-president, and Lawrence D. Wilson, Santa Fe, second vice-president. T. E. Castonguay, of the University of New Mexico engineering department, was re-elected secretary-treasurer.

Alton Skinner, Sr., has been elected president of the Durham, N. C., Engineers Club, succeeding P. D. Davis. Other officers are: M. A. Hunt, vice president, and Guy H. Bennett, secretary-treasurer.

Lawrence Merchants of Asheville has been elected president of the Engineers Club of Western North Carolina, succeeding E. O. Bryant. Other officers: V. M. Maclary, vice president, M. C. Teague, secretary; E. W. Milligan, treasurer; and Clyde R. Hoey, Jr., and Lawrence Hutt, directors.

W. R. Gelston, superintendent of waterworks, Quincy, Ill., has been elected chairman of the Illinois Section of the American Water Works Association, succeeding J. C. Mooman, manager, Northern Illinois Water Co. J. L. Hutt, succeeds C. N. Brown, as secretary-treasurer. Both are with the U. S. Pipe & Foundry Co. E. E. Alt, Chicago Bridge & Iron Co., was elected vice-chairman, and H. E. Hudson, Illinois State Water Survey, was named trustee of the association. Louis I. Birdsall, technical service engineer, General Chemical Co., received the Fuller Award for outstanding contribution to the waterworks industry.

Elmo E. Stuckey, Fort Wayne, assistant district engineer of traffic for the Indiana State Highway Department, has been elected president of the Traffic Engineers Association.

The Georgia branch of AGC has opened its new two-story building at 167 Harris St., N. W., in Atlanta. The branch was chartered by 18 companies in March, 1928, and has grown to 85 member firms. Ray M. Lee is president and Hugh W. Roberts is executive secretary. The new building was designed by Stevens & Wilkinson and constructed by Strother Barge Co.

The Florida Engineering Society has elected E. A. Nordstrom of St. Petersburg president to succeed A. P. Michaels of Orlando. Other officers are: W. H. Beisler, Gainesville, vice president; David B. Lee, Jacksonville, second vice-president; John B. Miller, Jacksonville, secretary, and Raymond Chase, Jacksonville, treasurer.

Ohio Sand and Gravel Association has elected C. W. Purdy, Killbuck, as president; C. R. Fuller, Portsmouth, vice-president; James H. Evans, Columbus, treasurer; and Claude L. Clark, Columbus, executive secretary.

Cigarette tax for sewers—Mayor Hixon of Tampa, Fla., says that money coming back to the city from the state cigarette tax will be used immediately for two badly-needed storm drainage projects. Tampa now has some $190,000 in reserve as its share of the tax that went into effect last September. Cost of the two sewer projects is estimated at $186,000.

MAJOR MEETINGS

Producers' Council, spring meeting, Washington, D. C., May 9-10.

Highway Conference, University of Florida, Gainesville, May 11-12.

U. S. Conference of Mayors, Waldorf-Astoria Hotel, New York City, May 11-12.

Florida Highway Conference, University of Florida, Gainesville, Fla., May 11-25.

American Water Works Association, Pacific N. W. section, Hotel Winthrop, Tacoma, Wash., May 11-13.

National Citizens Conference on Planning, Statler Hotel, Washington, D. C., May 12-13.

American Water Work Associations, annual conference, Convention Hall, Philadelphia, Pa., May 21-26.

Society for Experimental Stress Analysis, spring meeting, Hotel Statler, Cleveland, Ohio, May 25-27.

Building Officials Conference of America, Indianapolis, Ind., June 4-8.

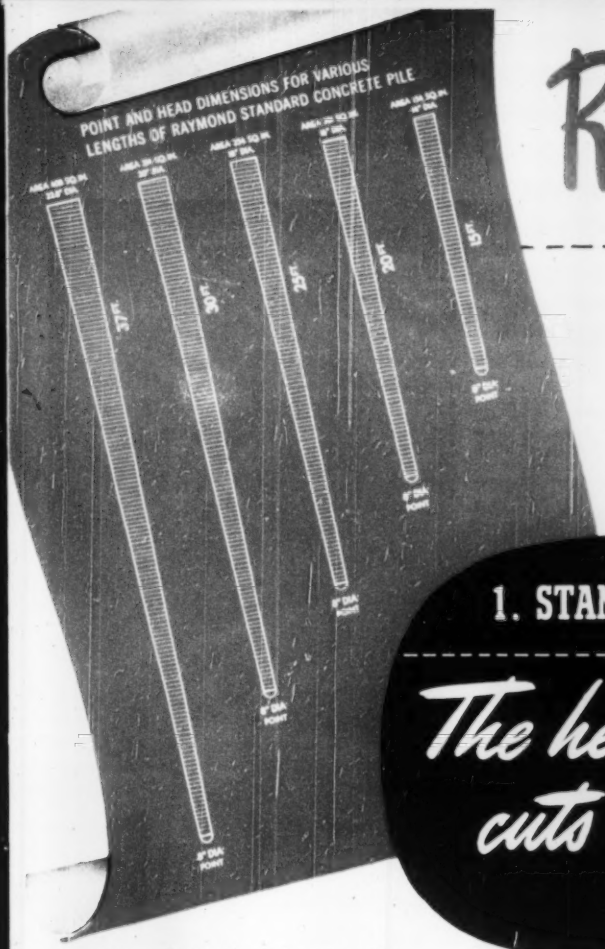
National Society of Professional Engineers, annual meeting, Hotel Statler, Boston, Mass., June 8-10.

Central States Sewage Works Association, Hotel Lincoln, Indianapolis, Ind., June 9-10.

Western Association of State Highway Officials, Mapes Hotel, Reno, Nev., June 12-15.

Pennsylvania Sewage Works School, State College, Pa., June 19-23.

Pennsylvania Water Works School, State College, Pa., June 26-30.



Raymond MAKES 5 TYPES OF CONCRETE PILES

1. STANDARD
2. STEP-TAPER
3. PIPE STEP-TAPER
4. COMPOSITE
5. GOW CAISSONS

Raymond installs every type of pile: cast-in-place concrete, precast concrete, steel pipe, wood and H-beam. Raymond operations include underpinning, borings and soil investigations, waterfront construction and harbor and river improvements.

1. STANDARD PILES

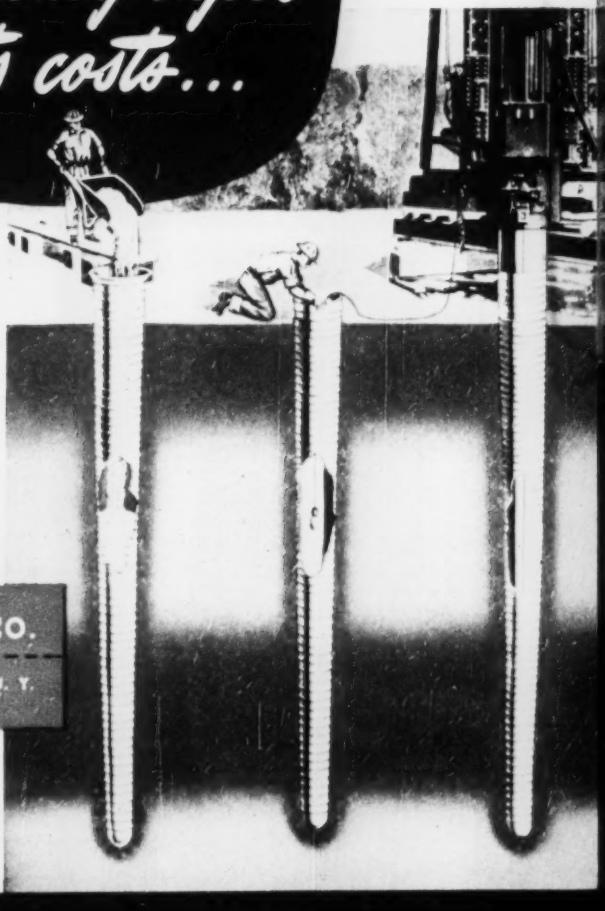
The heavy taper cuts costs...

Note that the permanent steel shell maintains the soil pressure developed during driving and while the concrete is setting, thus insuring a perfect pile free from distortion with a high load capacity.

Raymond Standard Concrete Piles have a heavy, uniformly tapered permanent steel shell. On friction piles, this taper acts like a wedge, giving these specific advantages:

1. Driving resistance is maintained.
2. The load is transmitted to the soil through the entire length of the pile.
3. The load can be carried by shorter piles, because of their greater carrying capacity.
4. Since shorter piles cost less to drive, the taper usually results in substantial savings.

Each of these statements has been tested and proved innumerable times. The evidence is at your disposal at any of our offices. Your inquiry is cordially invited.

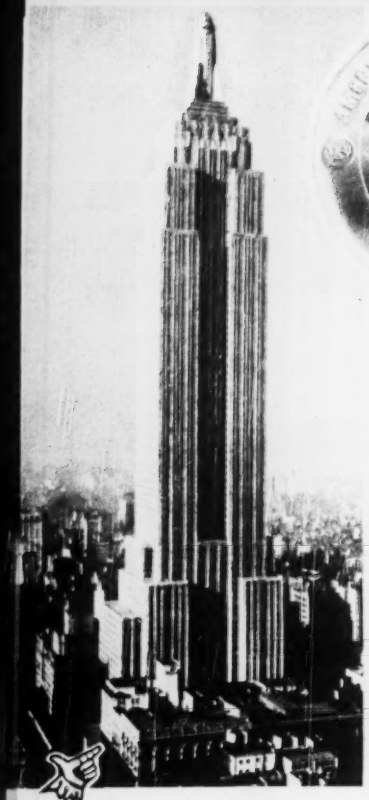


Raymond CONCRETE PILE CO.

140 CEDAR ST., NEW YORK 6, N. Y.

BRANCH OFFICES: Boston, Syracuse, Philadelphia, Baltimore, Washington, Pittsburgh, Atlanta, Miami, Houston, Kansas City, St. Louis, Cleveland, Chicago, Detroit, Portland, San Francisco, Oakland, Los Angeles and principal cities in Latin America

We pause to



SAN FRANCISCO OAKLAND BAY BRIDGE Completed in 1936, this is the world's greatest bridge. It is 8¼ miles between terminals, of which 1¼ miles is steel superstructure over the waters of San Francisco Bay.

EMPIRE STATE BUILDING The Empire State Building was fabricated by American Bridge Company in 1930. It is the tallest structure ever built, towering 1250' above the street level - 86 stories topped by a 55' penthouse section and a 150' airship mooring mast.

THE FLATIRON BUILDING The Flatiron Building (Fuller) in New York City was fabricated by American Bridge Company in 1901. When completed in 1902, it was perhaps the tallest skyscraper built up to that time.

A representative list of other American Bridge Company structures:

FABRICATED AND ERECTED

Athara River Bridge
Anglo Egyptian Sudan, Africa

Blue Water Bridge
St. Clair River, Pt. Huron, Mich.

Bronx Whitestone Bridge
East River, New York

Carquinez Strait Bridge
Crockett, Calif.

Charter Oak Bridge
Conn. River, Hartford, Conn.

Delaware River Suspension Bridge
Philadelphia, Pa.

Florianopolis Bridge
Santa Catharina Is., Brazil

Henry Hudson Bridge
New York City

Huey P. Long Bridge
Miss. River, New Orleans, La.

Lake Union Bridge
Seattle, Wash.

Thousand Islands Bridge
St. Lawrence River, N. Y.

Will Rogers Stadium
Broadmoor, Colo.

FABRICATED

Atlantic City Convention Hall
Atlantic City, N. J.

Carew Building
Cincinnati, Ohio

Chicago Post Office
Chicago, Ill.

Chrysler Building
New York City

Cleveland Municipal Stadium
Cleveland, Ohio

Grand Central Station
New York City

Outer Drive Bascule Bridges
Chicago, Ill.

Rockefeller Center - 9 Buildings
New York City

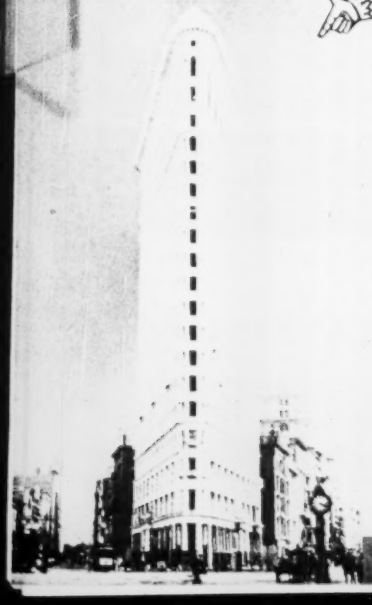
Russ Office Building
San Francisco, Calif.

Stevens Hotel
Chicago, Ill.

Wanamaker Stores
Philadelphia & New York

Woolworth Building
New York City

Yankee Stadium
Bronx, New York City



THE HELL GATE BRIDGE Completed in 1916, this bridge over the East River between Wards Island and Long Island, New York, was the largest arch span ever built up to that time.

reflect on 50 Busy Years

Come take a glance at just a few of the many jobs we have done over the past half century.

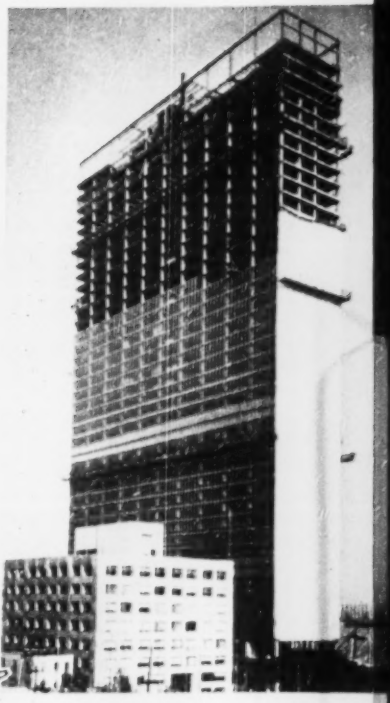
On May 12 the American Bridge Company celebrated its Fiftieth Birthday. But its structural steel experience and know-how are as old as the use of structural steel, and older. For the companies which merged in 1900 to form American Bridge Company brought with them a wealth of experience in the construction of all types of structures.

On these pages are shown but a few of the larger buildings and bridges fabricated, and in many instances, erected by American Bridge Company. Unfortunately space does not permit telling about the thousands of smaller steel structures which comprise a very important part of our Company's operations. For a more comprehensive picture, write for the booklet "Plants and Products - American Bridge Company." It is yours for the asking.

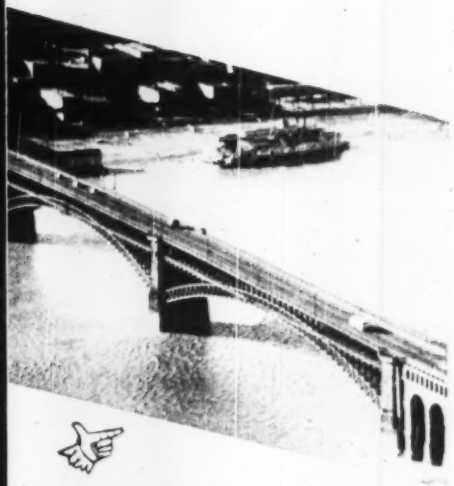
AMERICAN BRIDGE COMPANY

General Offices: Frick Building, Pittsburgh, Pa.

Contracting Offices in AMBRIDGE · BALTIMORE · BOSTON · CHICAGO · CINCINNATI · CLEVELAND · DENVER
DETROIT · DULUTH · ELMIRA · GARY · MINNEAPOLIS · NEW YORK · PHILADELPHIA
PITTSBURGH · PORTLAND, ORE. · ST. LOUIS · SAN FRANCISCO · TRENTON
UNITED STATES STEEL EXPORT COMPANY, NEW YORK



UNITED NATIONS SECRETARIAT BUILDING. This building has 39 stories above the street level and 3 basements. It is the first of three buildings making up the headquarters of the United Nations, New York, to be fabricated and erected by American Bridge Company.



EADS BRIDGE. Built in 1868-74 across the Mississippi River at St. Louis, Missouri, it was the first bridge in the United States in which steel was extensively used. The Keystone Bridge Company, one of the companies in the merger to form American Bridge Company in 1900, built this bridge.

THE BAYONNE BRIDGE. The Bayonne Bridge, spanning the Kill van Kull, was fabricated and erected by American Bridge Company. It was completed in 1931. This bridge has the longest arch span in the world.

AMERICAN BRIDGE

UNITED STATES STEEL

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OBITUARY

Ewald D. Steinhagen, 63, a Richmond, Va., civil engineer who was with the Resettlement Administration in Washington, D. C., in the mid-30s, died recently in Richmond as the result of an automobile accident.

Louis A. Deesz, 61, dean of the William Rayen School of Engineering of Youngstown, Ohio College, died April 19, while in Washington to attend hearings on the proposed Mahoning Grand Floodway. He was chairman of the Mahoning Valley Industrial Council's engineering committee and had served as full-time dean of the Youngstown College engineering school since March, 1948, having previously been a part-time instructor for four years. Before going into the educational field, he had 25 years' industrial experience. He was a graduate of Carnegie Institute of Technology. In 1930 he went to Russia for Freyn Engineering Co. of Chicago, and also did construction work in Siberia.

Clement L. Reamer, 85, retired civil engineer, died April 19 in Toledo, Ohio. He had held several municipal, county, and state engineering posts. He was a graduate of Baldwin-Wallace College, and served several years as Coshocton County, Ohio, surveyor, was city engineer at Newark, Ohio, and assistant city engineer at Columbus. He later was a consulting engineer and was associated with the construction of several dams and bridges in Ohio and Pennsylvania. He retired in 1929.

Oscar Sidney Bowen, 82, who served for 38 years in the engineering department of the Great Northern Railway, died in Wenatchee, Wash., April 15. He was resident engineer for the railway in Seattle for many years and later was assistant to the chief engineer in St. Paul, Minn. His work was chiefly construction and evaluation. He was vice president of the ASCE in 1924-25.

Gilbert R. Field, 46, project engineer for the U. S. district engineer's office at Ft. Worth, Tex., and his wife were killed in a collision with a truck near Houston on April 21. Mr. Field had been with the U. S. Engineers for 22 years and was a son of a former dean of the Georgia Institute of Technology.

Louis H. Otto, 64, prominent building contractor and manufacturer of ornamental and miscellaneous iron work, which included the present White House iron fence, died April 20 in Takoma Park, Md. Mr. Otto, who belonged to the Washington Building Congress, operated the Washington Stair and Ornamental Iron Works and his works adorn many Government buildings, including the Agriculture Department, many District public schools, the George Washington Memorial in Alexandria, Va. and the Central public library.

Col. Frank C. Boggs, 76, former head of the Army Engineers at Philadelphia, Pa., died April 18 at Paoli, Pa. He was graduated from West Point in 1898. During the building of the Panama Canal he was purchasing agent. He retired in 1928. Colonel Boggs was a technical adviser for the Century of Progress Exposition in Chicago.

Arthur V. Lynch, 62, engineer of subways for the Boston, Mass. Metropolitan Transit Authority, died April 24 at North Quincy, Mass.

Brig. Gen. F. D. Peck, 71, U. S. A., retired, died in San Francisco, Calif., April 22. A graduate of West Point, 1901, General Peck in the first world war built railroads in France and took part in the St. Mihiel and Meuse-Argonne offensives. For a time he was division engineer of the North Atlantic Division, with headquarters at New York, and he had also been in the Office of the Chief of Engineers in Washington, D. C.

Victory Memorial Bridge to be built at Nashville

State Highway Commissioner L. W. Eggleston of Tennessee says that work will begin early this summer on the $4,000,000 Victory Memorial Bridge over the Cumberland River at Nashville. The cost of this bridge and approaches is now estimated at $4,083,000, instead of the $2,500,000 appropriated. The bridge will be 770 ft long with a channel span of 320 ft and end spans of 225 ft each. Plans call for four traffic lanes, each 13 ft in width, with a 4-ft raised median strip and 6-ft sidewalks on either side.

The new bridge and approaches will start at Third and Main Streets on the east side of the river and will extend to the public square on the west side. On the west the new bridge will connect with the proposed Capitol Hill Boulevard, an S-lane thoroughfare which is a part of the joint federal-state-city redevelopment program for the Nashville area surrounding the State Capitol.

Cheaper by the Yard

...or why contractors use *ESCO* Dipper Buckets

3-yard ESCO Cast-Welded dipper on Lima 1201, working on Cuyuna range stripping operation of S. J. Groves & Son.

GREATER PAYLOAD CAPACITY per pound of bucket; fast loading; quick, complete discharge; ability to stand up under punishment—these are some of the qualities of *ESCO* Cast-Welded general purpose dipper buckets that give the operator more passes a day and more payload with each pass. They are the qualities that reduce the cost per yard of material moved.

Here are some of the jobs on which the built-in performance of *ESCO* buckets has been fully demonstrated: Neversink Dam; Garrison Dam; Pennsylvania Turnpike extensions; Merriam Dam; Washington-Baltimore Express Highway; Wautauga Dam; Beveridge Parkway; Pittsburgh Express Highway.

The records of sustained service made by *ESCO* dipper buckets under severe digging conditions are possible only because of their rugged construction. Details of construction and full information on sizes, dimensions and weights are contained in *ESCO* catalog 156-B. Get a copy from the *ESCO* office nearest you, or fill in and mail the coupon. Dealers in all major cities.

ESCO DIPPER, DRAGLINE AND COAL LOADING BUCKETS

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ELECTRIC STEEL FOUNDRY

Left: Bruce Street, Alexandria's first soil-cement street, was paved in 1939.

Below: Woodland Terrace, a typical residential street, paved with soil-cement, 1941.

SOIL-CEMENT

paves the way to durable, economical streets in Alexandria, Va.

IN 1939, Alexandria, Va., experimented with soil-cement paving in a one-block-long project on Bruce Street. This pavement withstood the severe winter of 1939-40 without a single surface break while virtually every other secondary street in the city suffered heavily from the extreme weather.

That demonstration, plus soil-cement's low first cost, convinced city officials of soil-cement's practicability for light-traffic streets. Since then more than 200,000 sq.yd. of soil-cement pavement have been placed in Alexandria. The superior performance of that paving prompted the City Council in 1948 to pass an ordinance specifying soil-cement base with bituminous surface for light-traffic streets in residential zones and concrete for heavier-duty streets.

C. L. Watkins, Alexandria City Engineer, writes: "The first winter's experience on Bruce Street has been followed by more than 10 years of added service. Our records show that there has been practically no maintenance on the soil-cement base.

"Our choice of soil-cement is predicated on two important factors—economy and durability, plus the fact that our soil conditions are favorable. The initial cost and low-maintenance cost of all-weather soil-cement base make it economical. Its durability is proved by its record to date of carrying daily traffic for over 10 years. In my opinion, the use of soil-cement is a major and permanent asset to our city."

Here's why soil-cement roads and streets are economical: (1) about 90 per cent of the required material is usually native soil already on the site, (2) construction is fast—large daily production, (3) inexperienced crews can quickly learn the simple construction procedures. For more information about economical, durable soil-cement roads and streets, write for free booklet available in U. S. and Canada.

PORTLAND CEMENT ASSOCIATION

DEPT. 5b-17, 33 WEST GRAND AVENUE, CHICAGO 10, ILLINOIS

A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

UNIT PRICES BID BY CONTRACTORS

New Water Supply for Bowling Green, Ohio

Close bidding from 45 contractors on the $1,400,000 Maumee River water supply project, Bowling Green, Ohio, resulted in contract prices averaging 5% below the engineer's estimate. Finkbeiner, Pettis & Strout, Toledo, O., are consulting engineers.

The job is divided into four sections. A low-service pumping station, B, 3 MGD water purification and lime, soda-ash softening plant, C, 45,000 feet of 20" transmission main, and D, 12,000 feet of distribution lines within the city.

Wages to be paid for common labor are $1.50 per hour, for skilled labor, from $1.65 to $2.375.

The contractors could bid on several alternatives in Sections B, C & D.

Bidders included:

A—Pumping station
1 Christopher Constr. Co., Columbus, O. — $75,405.00
2 E. H. Taylor Co., Detroit — 78,309.00
3 Messer Construction Inc., Fremont, O. (Cont.) — 95,831.10
12 Getman Brothers, South Haven, Mich. — 102,000.00
B—Water treatment plant
1 C. A. C. Construction Co., Fort Wayne, Ind. (Did not Bid) — —
2 Messer Construction Inc., Fremont, O. (Cont.) — 943,000.00
13 Getman Brothers, South Haven, Mich. — 514,488.00
(Cont.) Awarded contract on basis of combined bid for A and B of $961,567.
C—Transmission main
1 Omer Braeden & Son, Inc., Detroit (Contract) — $991,361.29
2 John Dehner Inc., Fort Wayne, Ind. — 413,953.00
33 Niles Excavating Co., Niles, Mich. — 570,789.50
D—Distribution system
1 Omer Braeden & Son, Inc., Detroit (Contract) — 99,995.35
2 Chas. F. McCurdy, Cincinnati, O. — 115,000.00
16 The Haddad Constr. Co., Columbus, Ohio — 109,257.50

Section A—Low Service Pumping Station

Item	Lump sum 1	%	Cont.	%
Entrance channel	$ 6,564	3.6	$ 6,200	3.6
Low serv. pump sta.	80,110	43.6	80,000	44.1
Set equip.	4,375	2.4	3,750	2.1
Low serv. turbine type pumps	6,250	3.5	7,063	4.0
Cont. one 500 gpm unit	3,250	1.8	4,191	2.4
Piping	3,612	2.1	3,506	2.0
Electrical	6,900	3.2	5,925	3.2
Low serv. fr. main	7,624	10.1	6,714	3.1
Cont. awarded combination A & B contract				

Section B—Water Treatment Plant

Item	Lump sum 1	%	Cont.	%
Chem. & filt. bldg.	133,500	31.1	168,874	32.8
Chem. feeders	15,200	3.1	13,651	2.6
Rapid mix mech.	2,200	0.5	2,042	0.4
Slow mix mech.				
Transver flow	7,900	1.6	5,509	1.1
Longitud flow	4,650	0.9	4,752	0.9
Electrol	8,600	1.7	8,157	1.6
Chlorg equip.	5,510	1.2	4,032	0.8
Carb dioxi equip.	6,000	1.2	5,525	1.1
Liquid CO2 type	5,500	1.1	3,902	0.8
Dry ice type	5,500	1.1	3,902	0.8
Settl basins 1 mgd	66,100	13.4	65,409	12.7
2 mdg	56,000	11.3	53,565	10.5
Sldg. rems. mech. for 1 mgd set bsn	11,600	2.3	10,684	2.1
2 mgd set bsn	10,600	2.1	9,394	1.8
Filter equip. units				
1	26,000	5.3	29,405	5.7
2 1st wash. tghs	26,000	5.3	25,806	5.0
1	19,200	3.9	20,101	3.9
* 2 1st wash. tghs	19,200	3.9	15,666	3.5
Free Wheeler bottm fltr			*	
Flow meters	3,120	0.7	2,561	0.5
Hagan rate type			*	

Section C—Transmission Main

Item	Quantity		Unit Prices 1 Cont.	2
Cast iron pipe				
20" bell & spigot	lf	43,300	$ 8.73	$ 9.14
20" mech. joint*	lf	43,300	8.55	9.61
16" bell & spigot	lf	43,300	7.56	8.10
16" mech. joint	lf	43,300	7.49	7.93
16" bell & spigot	lf	43,300	6.46	6.94
16" mech. joint*	lf	250	6.42	6.64
6" b & s*	lf	43,300	2.66	3.00
20" steel pipe	lf	43,300	9.32	9.79
18"	lf	43,300	8.64	8.25
16"	lf	43,300	7.79	8.27
20" Lock Joint	lf	43,300	8.25	8.77
18"	lf	43,300		8.12
16"	lf	43,300	6.78	7.30
Gate valves & boxes				
20"*	ea	11	851.45	713.00
18"*	ea	11	623.86	654.00
16"*	ea	11	579.25	550.00
6"*	ea	25	53.40	100.00
Air relief elves*	ea	29	220.00	222.00
Press relief elves*	ea	1	432.25	2,700
Fire hydrants*	ea	14	146.00	254.00
Deduct if no cathodic protect. of st. pipe 20", 18", 16"				3,200

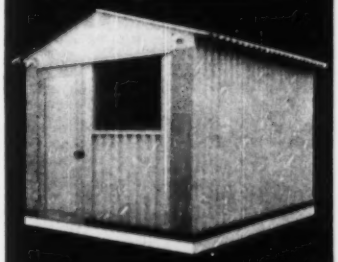
Section D—Distribution Mains

Item	Quantity		Unit prices 1 Cont.	2
Cast-iron pipe				
20" bell & spigot	lf	3,100	$ 6.78	$ 6.70
20" mech joint*	lf	3,100	8.63	9.33
16" bell & spigot	lf	300	9.46	8.69
16" mech joint*	lf	300	7.79	8.46
12" bell & spigot	lf	2,200	6.46	7.28
12" mech joint*	lf	2,200	5.21	6.33
10" b & s*	lf	20	4.10	6.67
8"*	lf	30	3.38	4.79
6"*	lf	200	2.63	4.34
4"*	lf	50	2.13	3.94
20" steel pipe	lf	3,100	9.62	10.63
18"	lf	300	8.87	9.61
16"	lf	300	7.81	8.36
20" Lock Joint	lf	3,100	8.62	9.67
18"	lf	300		8.94
16"	lf	300	7.23	8.19
Asbestos cmt pipe				
12"	lf	2,200	4.92	6.70
10"	lf	20	3.84	6.64
8"	lf	30	3.26	4.81
6"	lf	200	2.56	4.28
4"	lf	50	2.00	3.70
Gate valves & boxes				
20"*	ea	2	764.00	713.00
18"*	ea	2	625.00	654.00
16"*	ea	2	582.00	550.00
12"*	ea	12	352.00	350.00
10"*	ea	1	167.15	160.00
8"*	ea	1	93.10	130.00
6"*	ea	1	60.10	110.00
4"*	ea	1	43.10	95.00
New fire hydrts*	ea	8	146.00	254.00
Exist hydr to inst*	ea	1	75.00	100.00
Reconnect & sterlz exist 8" main*	ea	1c	1,611	1,650
Exist pave reinst*	sy	200	6.00	6.50
New corner sdwks*	sf	1,500	0.50	0.60
Rock excav.*	cy	500	10.00	12.00
Deduct if no cathodic protect st pipe 20", 18", 16"		lsc		lsc

*Contract awarded on these items
1† and 13 bidders bid these items
1† — $1,075; 13 — $ 22,50

Quantity adjustment prices				
Excav. rock bkfl.	cy			7.00
Conc. in place	cy		10.00	10.00
Bruif. st. in place	lb			12

A 10' X 12' LOW COST STEEL BUILDING OF 1,000 USES



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USF HANDY-HUT

No Field Welding or Riveting
2 Men Can Erect
Expansible!

Just the ticket for a field office, tool house, storage house, pump house or any one of a thousand uses for contractors and engineers. The USF Handy-Hut is an all-steel, prefabricated formed steel frame that simply bolts together with box corrugated roofing and siding sheets that attach with clip-and-wedge fasteners. No special tools are needed, no field punching, welding or riveting is required. Meets fire and windage codes most localities and is suitable for either permanent or portable use. Multiple units may be erected to accommodate any size requirement without special engineering.

USF also produces larger steel buildings of the same general construction in 10' and 12' clear heights with 26' or 30' span widths for erection in length multiples of 13'-4" to any desired size.

WRITE FOR DATA

USF United Steel Fabricators, Inc. Wooster, Ohio

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.
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WATER SUPPLY

BIDS ASKED

Va., Staunton (B.A. 4/26) (E. Eng. 2301 Grant St., Lynchburg) City at office City Manager, Staunton, water filtration and softening plant, construct circular prestressed concrete reinforced steel tanks, one existing tank with capacity of 1,000,000 gal., one new tank with capacity of 2,000,000 gal., concrete tank for backwash water, waste sump, concrete tank for clear backwash water, 4 rapid sand filters, and necessary appurtenant work, including valves, pipe connections, operating tables, new hot water pressure water line, electrical service, new hot water heating system, sanitary sewage septic tank and drainage field, necessary pipe for effluent, site and waste lines, grading and seeding of plant site, drives, etc., plans deposit $25. Wyatt, Sturgeon, Engineers, 2124 Kenmore Terrace, Norfolk, engrs.

† Georgia (B.A. 5/3) (E. Eng. 2301 Grant St., Lynchburg) water supply and distribution system, construct water supply and distribution system in Atlanta area of Alabama from an Elevation 1,400 contour to Monroe County, Ga., and from Elevation 1,400 contour to Monroe County, Ga., plans deposit $10. Mercer Co., Treas.

New Jersey (B.A. 5/10) (E. Eng. 1060 Broad St., Newark) water supply and distribution system, construct water mains, including 16-in. pipe line under Lower Ferry Rd. and Morton Ave. at intersection of Lower Ferry Rd. and Morton Ave. at Ewing Twp., Mercer Co. Plans deposit $10.

Que., Contrecoeur (B.A. 4/12) (E. M. Fitzgerald & Co., Ltd., 1 Notre Dame St. W., Montreal) WW extens., $40,000. Plans deposit $10. Lassonde & Dery, 2040 Drolet St., Montreal, engrs.

N. Y., Niagara Falls (B.A. 4/12) (E. Eng. 1 Niagara St.) At office Charles W. Johnson acting city mgr., City Hall, Zone 2, approx. 15 ft. dia. by 15 ft. high, concrete lined tunnel, invert below bed of Niagara River, 18 ft. diam. concrete lined shaft and intake structure, intake structure plans deposit $20. Sanders & Hansen, 200 S. State St., Chicago 4, Ill., engrs.

Va., Staunton (B.A. 5/19) At office Keith Burnley, city mgr., Municipal Bldg., filtration and softening plant, construct concrete aeration tank, concrete treating tank, waste sump, brick fire, concrete bldg. housing 4 rapid sand filters, piping, hydraulic gate, pilot valves, site controllers, operating tables and appurtenances, high pressure water line, electric service, hot water heating system, sanitary sewage septic tank, drainage field, 6" pipe lines for raw water supply and effluent, 2 mi. two mile reservoir at plant, plans deposit $25. Wyatt, Sturgeon, 2124 Kenmore Terrace, Norfolk, consultant engrs. CD 4/11.

Tex., Pleasanton (B.A. 5/1) (E. Eng. 1021 Travis Bldg., San Antonio) WW, $55,000. Extend water system, construct 12,000 l.f. Transit Tower, San Antonio, engr. CD 4/26.

Calif., Ventura (B.A. 4/19) (E. Eng. Council, 315 Montgomery St., S. F.) Water softening plant, $500,000. Oakland Ave. & Palm Ave. Carter Softening

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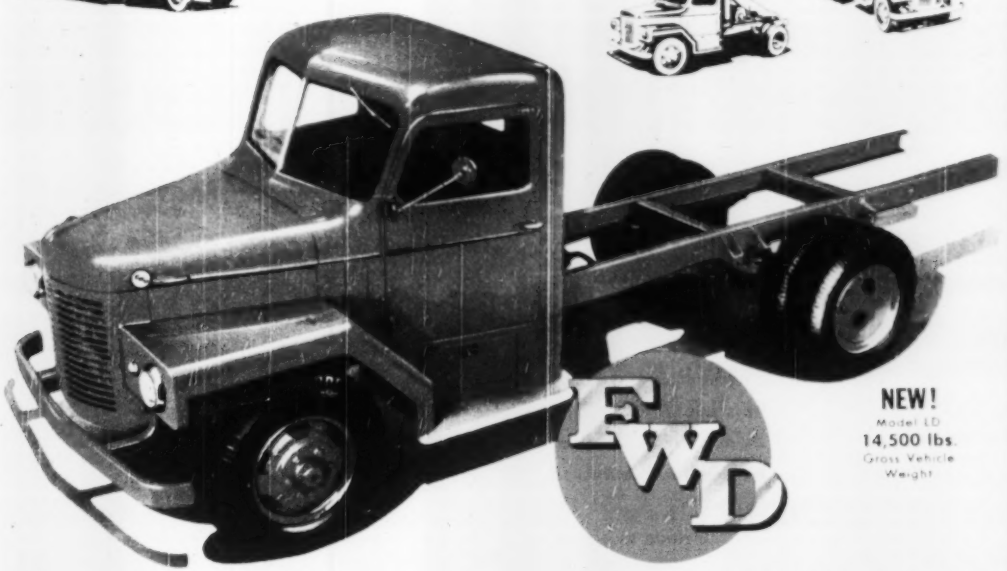

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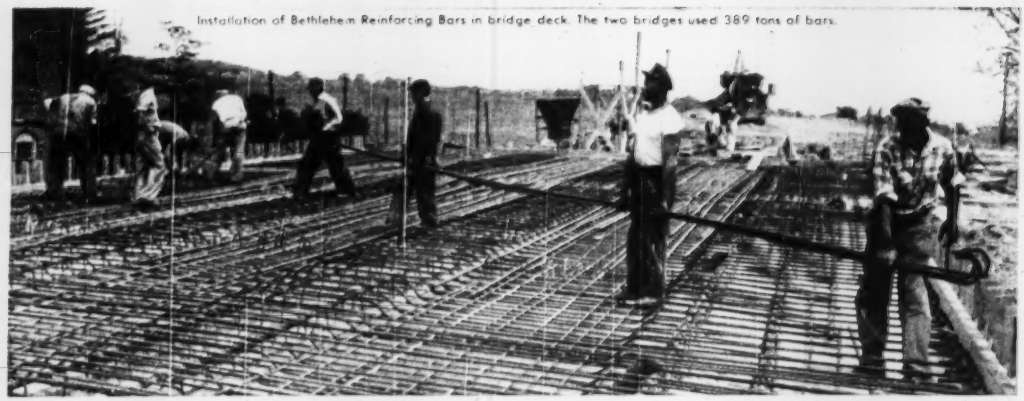
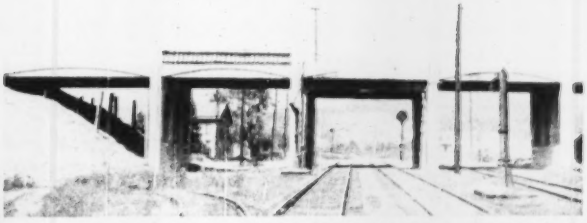


Installation of Bethlehem Reinforcing Bars in bridge deck. The two bridges used 389 tons of bars.

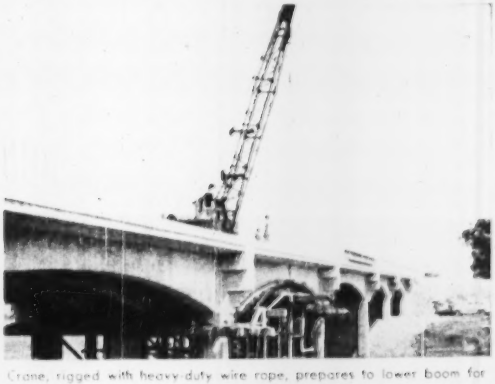
Improving a Highway in Eastern Pennsylvania

Francis C. Wagman (at left), and George A. Wagman, contractors, refer to blueprint in checking progress of job.



One of two new concrete bridges in the relocation project, shown above shortly before completion, carries the two-lane highway over railroad tracks.

Bethlehem Cable Guard Rail, mounted on Bethlehem Steel Posts at bridge approach, affords constant protection to motorists using the new highway.



Crane, rigged with heavy-duty wire rope, prepares to lower boom for new load. Bethlehem Wire Rope has many uses in road construction.

Continuing its highway improvement program, the Pennsylvania Department of Highways recently authorized relocation of 4913 ft. of Route 24, near York, Pa. Included in the construction of the new 2-lane road were two reinforced concrete bridges. Contractor: G. A. and F. C. Wagman, Inc., Dallastown, Pa. In addition to structural steel and bridge reinforcing, Bethlehem furnished dowel units, cable guard rail and steel posts.

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Dowel Units • Reinforcing Bars • Bar Mats • Guard Rail
Guard Rail Posts • Wire Rope and Strand • Pipe
Hollow Drill Steel • Spikes • Bolts and Nuts
Timber Bridge Hardware • Tie Rods
Sheet- and H-Piling • Fabricated Structural Steel

BETHLEHEM STEEL

(Continued from page 80)

R. I., East Providence—Town Bd. Selectmen, Town Hall, Contr. L. sewerage sys., extens. Watchemoket system, to C. L. Guild Constr. Co., Inc., 44 Water St., $021,858. Bids 4-13. CD 3-23.

S. D., Sioux Falls—City, laying 35 blocks sanitary sewer, West Sioux Falls, to Cowell Bros., 1043 S. Granger St., $61,396.

Tex., Houston—Home Owned Properties, Inc., Scanlan Bldg., sewage disposal plant, to Telepiem Constr. Co., 1710 Telephone Rd., $50,000. CD 4/19.

BRIDGES

BIDS ASKED

La., New Orleans—B.A. 5/16—Port of New Orleans, No. 2 Canal St., Rec. $2,485, runway bridges at Pub. Commodity Warehouse. Plans deposit $25.

New York—B.A. 5/15—New York State Bridge Auth., 22 Ferry St., Kingston, making borings, securing samples and other work incidental thereto on and adjacent to Hudson River in an easterly, westerly line across the river in vicinity of Mids Point, approx. 3 mi. north of Kingston Point. Plans deposit $15. D.-B. Steinman, 217 Liberty St., New York, Zinn & Consult. engr. CD 9/8/48.

O., Dayton—B.A. 5/18—Comrs. Montgomery Co., Jervie B. Gard, Mkt. Courthouse, repair, extend Bridge 147 on Old Dayton Rd. in Madison Twp. CD 2-22-49.

† California—B.A. 5/23—Bureau Reclamation, Dpt. Interior, Bids, 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Newman, structural steel, rail, beams, bearings, expansion joints, tie rods, and nuts and diaphragms for county road bridges at Stations 113 plus 38, 166 plus 38 and 232 plus 52, Newman Wasteway, Delta-Mendota Canal, Central Valley Proj., Spec. 3006. L. N. McClellan, ch. engr.

Minn., Duluth—B.A. 5/23—St. Louis Co., W. H. Borgen, aud., constr. 50-90-70 ft. steel beam span, 24 ft. roadway, bridge 7,022 over St. Louis River, 2.75 mi. sect. 2 Zm. S.P. 69-652-21 (SAR 27), Minn. Proj. 5924 (2). Approx. $50,000. Plans deposit $1.80, CD 4-22-48.

New Jersey—B.A. 5/23—New Jersey Turnpike Auth., Veterans Room, War Memorial Bldg., Trenton, Gloucester, Camden and Burlington Counties—15 steel concrete structures, cross-street paving and incidental work in connection with construction of Sec. 2, Woodbury Heights to Hartford Junction, 20. Plans deposit $5. Hamlett, Fleming, Conzing & Carpenter, Inc., 600 Delaware St., Harrisburg, Pa., engrs. CD 7/13/49, under Streets and Roads.

† Oregon—B.A. 6/2—U. S. Eng., e28 Pittock Block, Portland, Zone 5, 2 concrete abutments and 5 piers for steel railroad bridge at the upper crossing of Middle Fork Willamette River between railroad station 2014 plus 55 and 2055 plus 35, as part of relocation of Southern Pacific Company's Cascade Line R. R. at site of Lookout Point Dam Reservoir on Middle Fork of Willamette River southeasterly from railroad station Jasper, Lane Co., Inv. No. CivEng 34-026-50-145.

Pennsylvania—B.A. 5/23—Pennsylvania Turnpike Comm., P. O. Box, Harrisburg.

Allegheny Co.—Construct structures, grading, drainage and paving Turnpike Sect. 30 F, Western extens. of Pennsylvania Turnpike, from point 180 ft. east to the Hampton-Indiana Twp. line, easterly 20,276 ft., to a point 160 ft. east, east of Township Road 567 in Indiana Twp., approx. 3.84 mi.

Construct structures, grading, drainage and paving Sec. 30 E, western extens. of Pennsylvania Turnpike from point 160 ft. east of Twp. Road 534 in Hampton Twp., easterly 16,646 ft., to 240 ft. east of the Hampton-Indiana Twp. line, 3.15 mi. Plans deposit $50 each.

† Oregon—B.A. 6/2—U. S. Eng., Pittock Block, Portland, 2 concrete abutments and 10 piers for steel railroad bridge at upper crossing of Middle Fork Willamette River between railroad station 2014 plus 55 and 2055 plus 35, Lane Co., Inv. No. CivEng 34-026-50-145.

LOW BIDDERS

Oregon—State Hy. Comm., Salem, 2,140 ft. reinforced concrete and grade, surf. paving 0.61 mi. highway in Eugene, Lane Co., from Tom Lunsford, Reedsport, $452,124. CD 4/17.

Oregon—State Hy. Comm., Salem, Apr. 24, 6 piers for Marion Street Bridge over Willamette River at Salem, Marion Co., from State Hy. No. 1 (99), W. St. South, Seattle, Wash., $172,699. Peter Kiewit Sons, Co., owner, engr.

Ont., Ottawa—Dpt. P. Wks., Hunter Bldg., substructure and superstructure of Hy. bridge over Welland Canal, between Stamford and Allanburg Township, Lincoln & Welland Co., 1,128 ft. Dominion Bridge Co., Ltd., Lachine, Que., $712,414. CD 4-6.

CONTRACTS AWARDED

Calif., Sacramento—Sacramento Co., Courthouse, Walnut Grove bridge over Sacramento River to Isleton & Rio Vista, $526,300. Bids 4-19. CD 4-25, under LB.

▲ New Jersey—New Jersey Turnpike Auth., War Memorial Bldg., Trenton, Contr. 21, 17 steel concrete structures in connection with new Hy. between Newark and Prospect Plains, Mercer and Middlesex Counties, to P. T. Cox Constr. Co., Inc., 270 Broadway, New York, N. Y., $1,365,108. Bids 4-19. CD 4/23, under LB.

Oregon—State Hy. Comm., Salem, 504 ft. reinforced steel bridge on Pacific Hy. near Roseburg, grading,

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90° BLADE TRAVEL from one side to the other, cab-controlled • RETRACTABLE SCARIFIER blade revolves 360° without removing scarifier or teeth • HIGH WORKING CLEARANCES front and rear • INTERCHANGEABLE WHEELS • MECHANICAL STEERING with hydraulic booster • HYDRAULIC CONTROLS give immediate and positive response

Model No. and H. P.	APPROXIMATE WEIGHT IN LBS. TOTAL	ON FRONT WHEELS	ON REAR WHEELS	BLADE PRESSURE
HEAVY DUTY 4D-100				
Without Cab or Scarifier	22,879	6,617	16,262	11,900
With Cab and Scarifier	24,593	7,774	16,819	13,922
GENERAL DUTY 4D-76				
Without Cab or Scarifier	21,356	6,279	15,077	11,205
With Cab and Scarifier	23,070	7,436	15,634	13,227

W. A. RIDDELL CORPORATION • Bucyrus, Ohio

BUILDERS OF WARCO MOTOR GRADERS • HERCULES ROAD ROLLERS

Tom Lollesi, Kenosport, $229,329. Bids 4/25, CD 4-17.

STREETS AND ROADS

BIDS ASKED

† Nebraska B.A. 5-16 Bureau Pub. Roads, Federal Bldg., Kansas City, Mo. Concrete access road, Harlan County Dam site on Republican River, approx. 8 mi. east of Alma and 75 mi. southeast of Mc Cook. Serial No. CIVENG 23-028 50-197. CD 4-24.

† New Hampshire B.A. 5-16 Bureau Pub. Roads, Concord Electric Bldg., Concord.
Grafton Co. Proj. No. B-E1. New Hampshire Forest Hy. Proj. Plans deposit $10.

Fla., Jacksonville B.A. 5-18 City, City Hall, paving, resurf., reconstr. with E. Adley St. from Main to Pearl Sts. and constr. 2,373 sq. yds. of conc. pavg. strip with integral curb; paving, resurf., reconstr., w.o.n. Hubbard St. from north curbline of Pleuis St., to south curb line of B.S.L. paving, resurf., reconstr., with Ashley St. from Main to Market Sts. and from Market to Washington Sts. and constr. 2,331 sq. yd. of conc. parking strip with integral curb. CD 1/18/45.

† Fla., Key West B.A. 5-18 Construction Officer, P. O. Box 160, Naval Base, Charleston, S. C. Resurf. road at Naval Magazine, Fleming Key. Spec. 2401.

† Virginia B.A. 5-18 Bureau Pub. Roads, Dpt. Commerce, 1441 Wilson Blvd., Arlington.
Prince George and Dinwiddie Counties Conc. 3.234 mi. Petersburg National Military Park. Plans deposit $10.

Calif., Los Angeles B.A. 5-23 Bd. Supvrs., Los Angeles Co., Civil Hall of Records, Imper. Tyler Ave. between Bryant Rd. and Lower Azusa Rd. El Monte. $62,500. C. E. Arnold, in emgr. CD 4-28.

Minn., Olivia B.A. 5-23 Renville Co., C. A. Strom, aud. & st. seal, coat 6.5 mi. between 2.5 mi. S. of T. H. 212 at Bird Island and 4 mi. N. of T. H. 212, S. P. 43-507-05 (SAR 4); and S. P. 43-510-02 (SAR 6). Minn. Proj. 5-42 (a). Plans deposit $0 ea. Bit. wearing surf., stabilized gravel base, 6.1 mi. between 0.1 mi. N. of Buffalo Lake and 3 mi. N. of Hector, S. P. 43-602-03 (SAR 5); Minn. Proj. 5-186 (a). Plans deposit $10 ea. Bit. wearing surf., 7.1 mi. between T. H. 212 in Renville and North Co. line, S. P. 43-601-01 (SAR 4). Minn. Proj. 5-223 (a). Plans deposit $0 ea. grading, gravel surf., 7.6 mi. between T. H. 212 at Sacred Heart and North Co. line, S. P. 43-602-04 (SAR 9). Minn. Proj. 5-312 (a). Plans deposit $1.50 ea. W. G. Fullers, in emgr. CD 4-28.

O., Columbus B.A. 5-23 City, City Hall, improv. w.o.n. Hudson Rd. to Ledgard Ave., Hard Ave. to Ackerman Rd. to Ledgard Ave., Hard Ave. to Ackerman Rd. to Ledgard Ave., Hard Ave. to Ackerman

Lithographed on stone by James E. Allen

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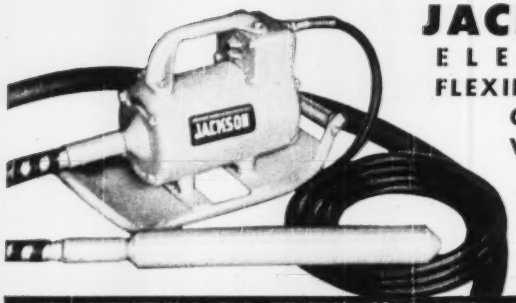

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Wherever either 115 volt, 60 cycle single phase AC or Direct Current is available, this relatively inexpensive vibrator will do a bang-up job of concrete placement.

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Available with any length of shaft up to 28 feet. Maximum length makes hard-to-get-to places readily accessible — saves time by making frequent changes of vibrator location.

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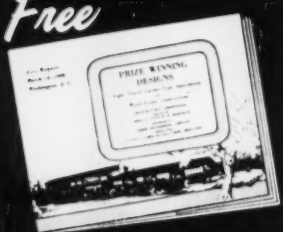

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(Continued from page 84)

Line Rd., Combined Proj., RS 1,250 and RS 1,410, Adair Co., L. B. $90,172; traffic bound limestone 1.861 mi., Dissappointment Bull Rub Rd., Proj. RS 1,410, Adair Co., L. B. $54,813; local bank or creek gravel, 7.263 mi., Cumberland River Rd., Proj. RS 72-71, Lyon Co., L. B. $127,022. CD 4-21 under LB.

Maine—State Hy. Comm., Augusta, Apr. 26, 6, conc. 4.05 mi., F.A.P. FI 151(3), H. E. Augusta, from H.E. Sargent, Inc., Stillwater, $432,652. CD 4-12.

Maryland—State Rds. Comm., Baltimore, Apr. 25, macad. base and surf. course, 6.7 mi., beginning at Lakeville, State Rte. 316, and northwesterly to Great Marsh Creek Rte. 335, Comar. D-225-115, Dorchester Co., from H. Lay Phillips & Co., Salisbury, base $213,700, alternate $178,898. CD 4-12.

New Jersey—State Hy. Dpt., Trenton, Apr. 27, pavement resurf. Route 56, Sect. 3 from Shore Rd., City of Absecon to Beach Thorofare, Atlantic City, Atlantic Co., from Eastern Eng. Co., 4 N. North Carolina Ave., Atlantic City, $476,318. CD 4/7.

N. J.—Trenton—City, City Hall, Apr. 27, repaving E. State St., Section from Albert E. Barrett, New Willow St., $159,723. CD 12/40/49.

▲ Pennsylvania—State Hy. Dpt., Harrisburg, Apr. 28, crushed aggregate base with bit. surf., 18 ft. wide, bit. surf. for surfacing bridge 8,763 ft. L. R. 22014 (1), from point 3/4 mi. from Hershey-Northeberle to joint at bridge over Swatara Creek near Townships Road 594, Dauphin Co., from Middlecreek Constr. Co., Middleburg, $93,922***construct divided highway consisting of two 24 ft. and variable width lanes of reinforced pavement on either side of an earth or concrete median, pavement 24 ft. and 44 ft. and variable in width incl. construction of 2 reinforced concrete structures, bit. surf. crushed stone base 22 ft. and variable to 40 ft. wide and an I-beam bridge, L. R. 24031 (1), 20351, Spur E (3), 23065 (1A), Appl. 361 (3), T. R. (1), S. 1, By-pass from point 3.16 mi. east of Media easterly, 13.461 ft. Delaware Co. from Joseph Cannuscio & Son, 1854 S. 55th St., Phila., $923,601***construct aggregate base with bit. surf. 30 ft. and variable to 45 ft. in width, width, pavement with crushed aggregate base 20 ft. and variable to 10 ft. in width, bit. surf. new base and existing pavement 30 ft. and variable in width for paving railroad crossing, 4,350 ft. L. R. 167 (4), T. R. 29 in East Stroudsburg, Penn. Manor Co. from Beers Coal Co., Hazleton, $129,711***width of pavement with crushed aggregate base 6 ft. variable in width, bit. surf. new base and existing pavement, construct crushed aggregate base with bit. surf. 20 ft., 22 ft. and variable in width, bit. surf. pavement 20 ft. and variable in width, construct reinforced concrete bridge 6,188 ft. L. R. 60058 (1-R), in village of Rocky Grove, north of Franklin, Venango Co. from Western Paving & Asphalt Paving Co., P. O. Box 1181, Erie, $97,629***bit. surf. pavement 22 ft. wide, incl. extensions reinforced concrete structures, incl. drainage 37,944 ft. L. R. 191 (5-4), T. R. 31 between Eighty-Four and New Eagle Boro, Washington Co. from John E. Boyer, George Washington Hotel, Washington, $357,596***crushed aggregate base with bit. surf. 18 ft. wide, incl. construct reinforced concrete and steel structures, construct reinforced concrete bridge, 15,643 ft. L. R. 62005 (1), from near Burgettstown northerly to intersection of Route 257, Washington Co., from J. A. Irwin, 200 Court Office Bldg., Washington, $219,966. CD 4/3.

CONTRACTS AWARDED

California—State Div. Hys., Sacramento, plant mix on imported base material surf. cement treated 2 reinforced girder bridges, 4.1 mi. between Atascadero and 1 mi. south of Templeton, San Luis Obispo Co., to M. J. Foster Constr. Co., 322 Elks Bldg., Stockton, $644,297. Bids 4-12. CD 4/19, under LB.

Mo.—Kansas City—City, Reed McKinley, dir. P. Wks., City Hall, widen, resurf. street (2 contracts), to Myers-Boyle Constr., 211 Graphic Arts Bldg., Kansas City, 6, Mo., $127,187, Bids 2/23, awarded 3-22. CD 2/1.

▲ New Jersey—New Jersey Turnpike Auth., War Memorial Bldg., Trenton, Contr. 3-3A and 3B, grading, drainage structures, overpass, underpass, stream bridge structures, etc., for Sect. 3, Deepwater to Woodbury, Salem and Gloucester Counties, to J. Cervas & Sons Co., State Hy. 35, Woodbridge, $5,095,733. Bids 4/21. CD 4/13, under LB.

▲ Pennsylvania—State Hy. Dpt., Harrisburg, widen, pavement with crushed aggregate base 4 ft. wide and bit. surf. new base and existing pavement; construct crushed aggregate base with bit. surf. 22 ft. wide; bit. resurf. existing pavement 22 ft. wide, incl. repairs to an existing structure, 62,162 ft. L. R. 107 (3), T. R. 322, between Port Matilda and Philipsburg Boros, Centre Co., to Harold B. Stabler, 635 Lucknow Lane, Harrisburg, $629,521. conc. base with bit. surf. 34.08 ft. in width on each side of an existing earth divider, plain conc. base with bit. surf. 34.08 ft. in width and bit. surf. for adjustment, 20,981 ft. L. R. 67009 (3), T. R. 10, S. 1, on Roosevelt Blvd., in city of Philadelphia, Philadelphia Co., to James D. Morrissey, Inc., 4814 Frankford Ave., Phila., $704,240. Bids 4-11. CD 4/18, under LB.

Tex.—Houston—Home Owned Properties, Inc., Scanlan Bldg., street constr., paving, to Tellepsen Constr. Co., 2710 Telephone Rd., $70,000. CD 4/14.

Alberta—Province of Alberta, Edmonton, asph. surf. 44 mi., Viper to Wrentham, to National Paving Co. Ltd., Calgary, $583,517; high surf. 23 mi., Lacombe to Two to Mannix O'Sullivan Paving Co. Ltd., Edmonton, $327,170. CD 12-3-49.

EARTHWORK, WATERWAYS

Connecticut—B.A. 5/15—State G. Albert Hill, state highway commr., State Office Bldg., Hartford, designs in brief, for breakwater, Niantic Bay, Niantic River, and jetties, Niantic River, Niantic Bay, Long Island Sound, Niantic, Conn. Plans on file at office of Resident Engr., New Haven Trade Line Proj.

New Jersey—B.A. 5/15—U. S. Engr. Dept., Planning & Development Br., 90 Church St., New York, N. Y., for protection of Raritan River, Perth Amboy, N. J., by jetties, breakwater and revetment. Estimate \$[illegible]. Plans on file at office of Dist. Engr., Custom House, New York, N. Y.

† Connecticut—B.A. 5/16—U. S. Engr. Armory, Boston, Mass., dredging Mianus River, Greenwich, Conn., for disposal of excavated material in spoil disposal area 2,000 ft. of inside steel sheet piling, Norwalk River, Conn. 14,000 cu. yds. Estimated date CD 4-17.

† Illinois—B.A. 5/16—U. S. Engr. Custom House, Chicago, Ill., for dredging Calumet River, Ill., and Indiana Harbor, Ind., by Government plant. Item III-C, Waterway Improvements, Calumet River, Ill. and Ind. Estimated date CD 4-22.

† South Carolina—B.A. 5/16—U. S. Engr. Customhouse, Charleston, maintenance dredging, Cooper River, Charleston Harbor, S. C. Estimated date CD 4-19, under I.R. Civil Works Act of 1939. Serial No. CIVENG 38-054.

† Virginia—B.A. 5/16—U. S. Engr. Customhouse, Norfolk, dredging James Creek, Hampton, Elizabeth River, Va. Serial No. CIVENG 38-110. Plans on file at office of Dist. Engr., Custom House, Norfolk, Va. Estimated date CD 4-22.

† South Carolina—B.A. 5/16—U. S. Engr. Customhouse, Charleston, maintenance dredging, Cooper River, Charleston Harbor, S. C. Estimated date CD 4-19, under I.R. Civil Works Act of 1939. Serial No. CIVENG 38-054.

† Virginia—B.A. 5/16—U. S. Engr. Customhouse, Norfolk, dredging James Creek, Hampton, Elizabeth River, Va. Serial No. CIVENG 38-110. Plans on file at office of Dist. Engr., Custom House, Norfolk, Va. Estimated date CD 4-22.

† Ohio—B.A. About 5/17—U. S. Eng., Marion Ave. and B St., West Huntington, W. Va., pump sta., dam, levee, protection works, Ziegler Run, Kenova, Ohio. Serial No. CIVENG [illegible]

† Ohio—B.A. About 5/17—U. S. Eng., Marion Ave. and B St., West Huntington, W. Va., pump sta., dam, levee, protection works, Ziegler Run, Kenova, Ohio. Serial No. CIVENG [illegible]

† In Turin—B.A. 5/16—Soil Conservation Service, 434 U. S. Post Office & Court House, Milwaukee, Wis., control work, Clay Mines Waterway, Part 2, 1,316 cubic yards, more here.

† Louisiana—B.A. 5/17—U. S. Eng., Foot of Prytania St., New Orleans, La., Items 1 to 10, inclusive, for Mississippi River Ship Channel, Gulf to Baton Rouge, La., Project Depth 45 ft. Mile 97.22 to Mile 172.22 above Head of Passes, Mississippi River

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(Continued from page 87)

† Nebraska—B.A. ... Eng. 1764 Jackson St., Omaha, underpass-grade control facilities for Apr. national cemetery. Unit R-573 (CIVENG 20-066-50-174) CD 4-19.

▲ Ont., London—B.A. ... Junction Park, Upper Thames Valley Assn., Queens Park, London, and Tashmoo Park, both 20 miles E. of London, to write up the land and water use plans. Apr. 28 (further details in early issue). Apr. ... Serial No. CIVENG 18-020-50-95.

† Pennsylvania—B.A. about ... S. Eng. 24 St. and Maryland Ave., P. O. Box 1720, Baltimore 3, Md. ... pump station, reservoir, ... Serial No. CIVENG 18-020-50-95. ... 0125. Orig. ... St. Niagara Falls, engr. CD 2-16-50.

† California—B.A. ... Bureau Reclamation, Dist. Office, Interior, Bldg. 1, A Denver Federal Center, Denver, Colo. Furnishing ... 4.16 kv. cable shielding power or 2.3 kv. ... Walnut Grove, embedded metalwork for two 60 x ... 3 manual gates for head gate structure, Delta Cross Channel, Delta Div., Central Valley Proj., spec. 804. ... N. McClellan, chf. engr.

▲† Minn., Minneapolis—B.A. ... U. S. Eng. 1217 U. S. P. O. and Custom House, St. Paul, Zone 1. Constr. Lower Lock and Dam 1, Anthony Falls, Upper Mississippi River, ... reinforced ... masonry piers of railroad bridge. Approx. $1,600,000. CD 4-4.

† Wyoming and South Dakota—B.A. ... Bureau Reclamation, Dist. Office, Interior, Missouri ... Wyo. ... existing keystone Dam, keystone Unit, Cheyenne River ... S. D. Bids to be opened ... Office, Interior, Missouri ... Wyo. ... Mont. Area Office, Proj. Constr. Div., Spec. 2-805, 1 N. Wacker, Bldg. 1-A, Denver Federal Center, Denver. ... CD 12-29.

† Arizona and California—B.A. ... Bureau Reclamation, Dist. Office, Interior, ... operating to ... Stations 213 ... 1272, Plug 40, and ... Lake Havasu, Ariz., ... N. McClellan, chf. engr. CD 4-12-50.

Pennsylvania—B.A. ... Dist. Forests & Waters, 804 Education Bldg., Harrisburg, to ... approaches at Pennsylvania Turnpike ... Apr. 28. Plans ... comp. ... at ... and water lines at ... Tamaqua site and appurtenances ... Schuylkill River. $100,000. ... Schuylkill River, $100,000; ... Schuylkill County and Kelayres ... Quakake Creek

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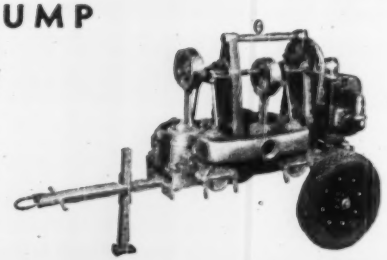

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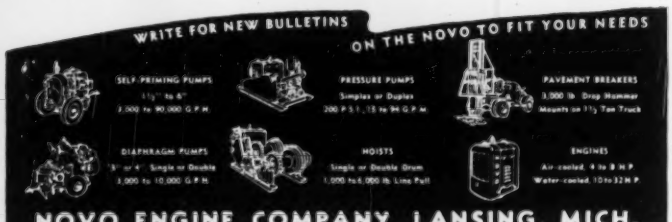

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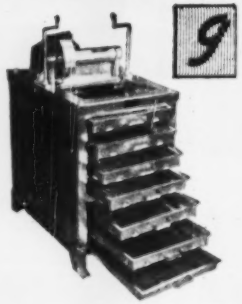

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Ill., Alton—POWER PLANT—B.A. $126—State of Illinois, Springfield, general work, power piping, plumbing, heating, ventilating, boiler and stoker work on one unit at Alton State Hospital. $400,000. CD 4-9-45.

Ia., Ogden—POWER PLANT—B.A. $126—City, City Hall, Ogden, steam plant and 2 new power unit additions. $115,000. Plans deposit $10. Herrington, Kelly Co., Standard Bldg., Omaha, Neb., engr.

† Md., Annapolis—BLDG. ALTERATIONS—B.A. $126—Navy, Wash., D.C., Naval Academy, Annapolis, interior alterations to Bldg. 141, New Commandant's Residence, Bldg. 142. Plans deposit $10. (Re-corrected data.) CD 11-2-49.

N. C., Hoffman—LAUNDRY—B.A. $126—State Bd. Correction & Training, Sam L. Leonard, Supt., Sanatorium, Hoffman, 2 dormitories, 2 staff houses, kitchen, mess hall and addition, new boiler room, laundry, laundry room, fan and transformer house. Plans deposit $10; general, $25; mechanical, elec., plumbing & heating, $10. Leonard Parker Assoc., George R. Herrington, 10 S. Wilmington St., Raleigh, engrs.

† R. I., Providence—WATER TREATMENT PLANT—B.A. $126—Navy, Wash., D.C., Construction & Engineering Command, Providence, Bldg. 128, Naval Supply Depot, Melrose Park, Pa., for water treatment plant, 4 MG capacity. Plans deposit $10. Naval Station, Newport, R.I., Bldg. 135, Naval Training Center, Sampson, N.Y., 23306, deposit $10.

B. C., Coquitlam—HIGH SCHOOL—B.A. $126—A. H. Lewis, Secy., School Dist. #50, Anderson Ave., New Westminster, frame high school. Approx. $400,000. Plans deposit $25. C. F. Evans & Son and W. B. Ash, 219 W. Pender St., Vancouver, archts. CD 1-22-47.

B. C., Port Moody—HIGH SCHOOL—B.A. $126—A. H. Lewis, Secy., School Dist. #50, Anderson Ave., New Westminster, frame high school. Approx. $375,000. Plans deposit $25. C. F. Evans & Son and W. B. Ash, 219 W. Pender St., Vancouver, archts. CD 1-22-47.

▲ Ga., Atlanta—COLISEUM—B.A. $127—Fulton Co., courthouse annex, $2,500,000. Bond & Hunt, 1 W. Alabama, W. J. Creighton Forsyth Bldg. archts. CD 7-22-48.

La., Baton Rouge—SCHOOL—B.A. $127—East Baton Rouge Parish School Bd., City Hall, 40,000 sq. ft. joint gymnasium-cafeteria addn. at Baton Rouge High School. Approx. $250,000. Bodman & Murrell, 713 Raymond Bldg., archts.

Pennsylvania—MAINTENANCE—B.A. $127—Pennsylvania Turnpike Comm., 11 N. 4 St., Harrisburg, 4 maintenance bldgs., one each in York and Chester Counties, two in Lancaster Co. eastern extension of Pennsylvania Turnpike. Plans deposit $10. R. B. Stone, c/o owner, engr.

▲ Pa., Phila.—MAXIMUM SECURITY—B.A. $127—General State Auth., 18 and Herr Sts., Harrisburg, Maximum Security Bldg., 7 ft. at Penn. (Byberry) State Hospital. $2,500,000. Plans deposit $50. Shoper & Lipitz, 2112 Locust St., archts. A. E. Jones, c/o owner, engr. CD 2-16-47.

Ont., Ottawa—STATION—B.A. $127—Army, Navy, Dept. of Works, Bldg. Supply Section, and Forestry, Dept. of Mines and Resources, Bureau of Statistics, 8th Floor, Booth Bldg., Ottawa, Ont., for Experimental Farm, Dominion Rubber Dyed Cotton Duck. Approx. $500,000. Plans deposit $75. D. Hazell, c/o owner, engr.

Ky., Lakeland—HOSPITAL—B.A. $128—Commonwealth of Ky., Div. Purchase, New State Office Bldg., Frankfort, Female Ward Bldg., 2 sty., 3 section, State Hospital, Request No. 51611. J. B. Speed, c/o Hospital, Frankfort, engr. CD 1-27-47.

† N. M., Los Alamos—AIR FIELD—B.A. $128—U. S. Army, Santa Fe, Army engrs., Albuquerque, for brick and frame hangar. A.T.A. Inc., 2741-2743 Broadway, $400,000 Steel. Plans deposit $50.

N. C., Raleigh—ARMORY—B.A. $128—Adj. Gen., North Carolina State Defense Armory, Raleigh, armory and assembly bldg. Plans deposit $50. Edwards & Sluder, 1520 Fairfield Ave., Charlotte, and C. W. Breese & Assoc., Sheldon Bldg., archts. and engrs. CD 5-13-48.

† Pa., Reading—ARMORY—B.A. $128—Adj. Gen., Harrisburg, for armory and assembly bldg. at Reading. Plans deposit $50. N. W. Wash, 20 E. Penn Sq., Reading, archt. and engr. CD 4-15-48.

† S. C., Parris Island—BARRACKS—B.A. $128—Navy, Wash., D.C., Eastern Div., Naval Base, Charleston, for 2 recruit barracks, Bldgs. 2 and 3, Recruit Depot, Parris Island. Plans deposit $10. Naval Station, Charleston, S.C., Bldg. 902, Naval Base, Charleston, erection, Bldg. 1, for overhaul, repair, modernization and conversion of Destroyer Escort Vessels, Bldg. 2, for Boat Repair Shop, Bldg. 3, for Boat Repair Shop, Bldg. 4, for Boat Repair Shop, Bldg. 5, for Boat Repair Shop, Bldg. 6, for Boat Repair Shop, Bldg. 7, for Boat Repair Shop, Bldg.

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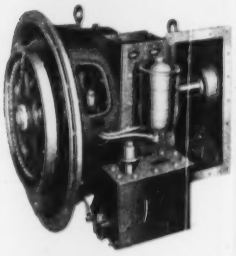

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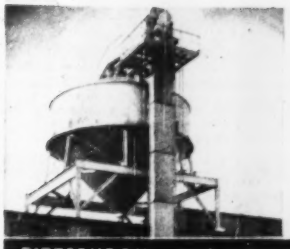

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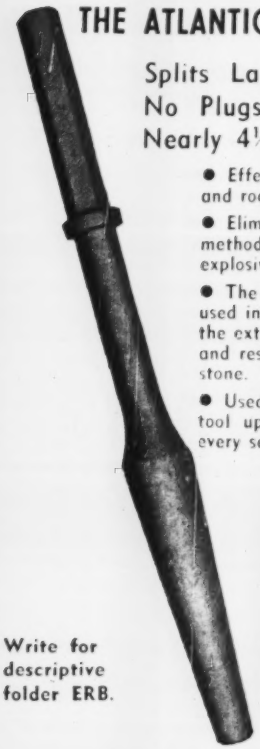

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LOW BIDDERS

▲ Conn., Hartford—HOUSING—City of Hartford Housing Auth., 846 Asylum Ave., Apr. 25, moderate rental housing, Albany Rd.; from F. H. McGraw & Co., 101 Park Av., New York, N. Y., $3,020,000. CD 4/7.

Pa., Erie—SCHOOL—Bd. Educ., Erie, Apr. 12, 2 story, brick, rein.-con. Glenwood School, Peach and Rustic Sts.; from Sessoghian & Ostergard, 1125 Peach St., $386,000. CD 4/7.

Tenn., Savannah — HOSPITAL — Hardin Co., Savannah, Apr. 25, hospital; from Seth E. Glem & Assoc., Porter Bldg., Memphis, $346,990.

CONTRACTS AWARDED

▲ Calif., Porterville—INSTITUTION—State Div. Architecture, P. O. Box 1037, Sacramento, general contract, thirteen 1 story, 179,000 sq. ft. State Institution for Epileptics; to Nomellini Constr. Co., Box 117, Stockton, $2,495,682. Bids 4/18. CD 4/25, under LB.

▲ Conn., Bridgeport — HOUSING — City of Bridgeport Housing Auth., Anthony D. Greco, chm., 504 dwelling units, Beer Court, Block 2, 6 & Sect., to E & F Constr. Co., 94 Wells St., $3,794,440. Bids 4/27. CD 4/20, under LB.

Conn., Norwich — HOUSING — Town of Norwich Housing Auth., Irving Spring, chm., 53 family units, off Elizabeth St. and Clay Court; to J. J. Kirlin, 219 Ridgefield St., Hartford, $509,840. Bids 4/11. CD 4/25, under LB.

▲† Ill., Chicago — HOSPITAL — Veterans Admin., Vermont Ave. between H and I Sts. N. W., Wash. 25, D. C., general contract research hospital for Veterans Administration at Fifth, Huron and Fairbanks Ct. and McClurg St.; to W. O'Neil Constr. Co. & Kenny Constr. Co., 111 W. Washington St., $12,146,100 excavation and substructure, Method B, to Montgomery Elevator Co., Moline, $538,838. Bids 4/18, awarded 4/26. CD 4/20, under LB.

Miss., Canton—PLANT—City, City Hall, milk pasteurization plant; to L. B. Webster & Sons, Meridian, $52,950. Bids 4/21. CD 4/7.

N. Y., Henrietta—SCHOOL—Bd. Educ., Rush-Henrietta Central School Dist., Henrietta, central school; to A. Friedgen & Sons, 710 Lake Ave., Rochester, $774,693. Bids 4/11. CD 4/11.

▲† O., Cincinnati—HOSPITAL—Veterans Admin., Vermont Ave. between H and I Sts. N. W., Wash. 25, D. C., Hospital Bldg. 1, Nurses and Staff Apartment Bldg. 2, Attendants Quarters Bldg. 6, Station Garage Bldg. 7, Boiler Plant, Laundry Bldg. 8, Laundry Bldg. 9, Radial Brick Chimney 10, Underground Wet Salt Storage Basins 10, Underground Soft Water Reservoir 11, Steel Fuel Oil Tank 12, Spec. Assist. Proj. No. 2467, to John A. Sorge, Inc., 270-41 St., Brooklyn, N. Y., $7,278,983. Bids 3/28, awarded 4/25. CD 4/20, under LB.

Ore., Myrtle Point—SCHOOL—School Dist. 41-C, Myrtle Point, 28 room school; to A. T. Fix, 421 Simpson St., North Bend, $368,945. Bids 4/10. CD 4/21.

Ore., Portland — SCHOOL — Multnomah School Dist. 1, 631 N. Dixon ave., Edwin Markham School; to Gerard Pitt, 1212 Congress Bldg., Miami, $517,500. Bids 4/11, awarded 4/14. CD 4/14.

▲ Ore., Portland—OFFICE—State Bd. Control, Capitol, Salem, 10 story office; to Rasch & Hornwitz, 1435 N. Hunt St., $1,366,477. Bids 4/6. CD 4/20, under LB.

COMMERCIAL BUILDINGS

BIDS ASKED

Ga., Decatur—BANK—B.A., 5/16—First Natl. Bank, Ponce & Forrest, F. Smith, archt., Whitehead Bldg., Atlanta, Ga.

Kan., Ottawa—HOSPITAL—B.A., about 8/1—Rd. Trustees, Ransom Memorial Hospital, brick, rein.-con. hospital addn., $400,000. Jos. W. Radzinsky, 3401 Fairfax Trafficway, Kansas City, Kan., archt. CD 4/14.

SOON LETS CONTRACT

Ala., Birmingham—BANK—Birmingham Trust National Bank, c/o Miller, Martin & Lewis, archts., Title Guarantee Bldg., soon lets contract, 4 story bank.

Fla., Miami Beach—HOTEL—Fontainebleau Annex, Inc., c/o Gerard Pitt, 1212 Congress Bldg., Miami, soon lets contract, Hotel Annex, $750,000.

S. C., Hartsville—SCIENCE—Coker College, Hartsville, soon lets contract, science bldg., Hopkins & Dixon, Florence, archts. CD 2/24.

LOW BIDDERS

Miss., Jackson—CHURCH—Calloway Memorial Methodist Church, N. Congress St., Apr. 24, church alterations, addns.; Hart Lee & Mullins, Inc., P.O. Box 485, Columbia, $314,446. CD 4/19.

CONTRACTS AWARDED

Ala., Birmingham—HOME—Morris Clem, 214 10 St. N., 47 houses, owner builds, $350,000.

Calif., Hayward—RESIDENCES—Hayward Homes, Inc., Hayward Highline Addn., 100 houses, apartments and three 5-by room recreation, $1,000,000. T. P. Bechtel Co., 315 13 St., Oakland, $613,000.

Conn., Stamford—HOUSING—First & Son, Albin St., 35 single frame houses, Avon St. Owner builds, $275,000. Vitra & Vitra Assocs., 77 South St., archts. CD 4/26.

Conn., Stratford—HOUSING—Stratford Homes, Inc., 212 Pleasure and Fremont Sts., 30 frame houses, Pleasure and Fremont Sts., owner builds, $400,000.

(Continued on page 96)

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(Continued from page 94)

Conn., Wethersfield — HOUSES — Liberty Homes, Inc., 2305 Main St., Hartford, 100 family units, Forest Dr., Beach Tree Dr., Cornish, Fletcher and Laconia Rds., Owner builds. $850,000.

Ill., Chicago — CHAPEL — Congregation Helpers of the Holy Souls, 325 S. Barry St., Zone 24, chapel, to McCarty Bros., Inc., 1846 W. Harrison St., Zone 7, $250,000. Awarded 4/24. Barry & Kay, 53 W. Jackson St., Zone 4, archts.

Ind., Anderson — HOUSES — Madison Co. Lbr. Co., 2425 Jackson St., 30 houses in Indian Meadows addn. between State Rd. 9 and by-pass. Owner builds. $250,000.

▲ Kan., Kansas City — RESIDENCES — Wm. Rau Corp., 2026 Main St., Kansas City 6, Mo., 400 houses, Meadow Lake, near here. Owner builds. $5,000,000.

Kan., Topeka — OFFICE — Owner, c/o Stookey & Howells, archts., Insurance Bldg., 3 story, 100x125 ft. office, 402 Topeka Blvd., to M. W. Watson, National Bank of Topeka Bldg., Topeka. $250,000. CD 3/3.

Pa., Pittsburgh — SYNAGOGUE, etc. — Tree of Life Congregation, 218 Craft Ave., 2 story, 91x90 ft., 14x62 ft. service ft., brick, stone, steel frame synagogue and school Shady and Wilkins Sts., to Brooks Constr. Co., 230 6 St. $309,000. Bids 4/4. CD 3/31.

Tenn., Memphis — HOMES — Jacobson & Lovitt, c/o George Mahoney, archt., Columbian Mutual Tower, 38 homes in Sharron subdivision. Owner builds. $250,000.

Tex., Dallas — DWELLINGS — Moody & Tips, 701 Forest Ave. Rd., 50 addtl. dwellings. Owner builds. $275,000. CD 3/3/49.

INDUSTRIAL BUILDINGS

SOON LETS CONTRACT

Que., St. Laurent — FACTORY — F. G. Brassard, archt., 1440 W. Ste. Catherine St., Montreal, soon lets contract, 1 story, 150 x 180 ft., concrete, structural steel, brick factory, King's Rd. for Perkins Tissue Mills Ltd., 424 Guy St., Montreal.

LOW BIDDERS

Ala., Montgomery — SALES and SERVICE — Ray Brooks Mchy. Co., c/o Pearson, Tittle & Narrows, archts., First Natl. Bank Bldg., construction equipment sales and service bldg., from Jehle Bros., 628 Mt. Meigs Rd. $132,864. CD 4/1.

N. D., Velva — GENERATING PLANT — Central Electric Power Cooperative, Velva, boiler feed pumps, from Pacific Pumps, Inc., 5715 Bickett St., Huntington Park, Calif., $51,975; cooling towers from Marley Co., Inc., Fairfax and Marley Rd., Kansas City, Mo., $42,047. Ulteig Eng. Corp., 1114 1/2 Front St., Fargo, engrs. CD 12/23.

CONTRACTS AWARDED

Ark., Camden — WAREHOUSE, etc. — Ouachita Rural Electric Cooperative, Camden, warehouse and office, to Daugherty Constr. Co., 200 River Rd., Little Rock. $80,000. Bids 4/5.

▲ Ark., El Dorado — VAPOR and RECOVERY UNIT — Pan American Southern Corp., El Dorado, 2nd unit, catalytic cracking vapor and recovery unit, to Foster Wheeler Corp., Shell Bldg., Houston, Tex. Approx. $2,700,000.

Ind., Peru — PLANT — H. A. Thomas & Co., Peru, 160 x 400 ft. steel, concrete plant, separate contracts. $150,000.

Md., Baltimore — WAREHOUSE — Calvert Drug Co., 115 W. Redwood St., 1 story, 75 x 181 x 240 ft., reinforced brick, steel, mfg. warehouse, bid Certain Auto Conveyor and Supply Co., 20 S. Frigate St., $225,000. H. H. Moulton Co., owner archt.

N. J., Monmouth Junction — WAREHOUSE, etc. — Colonial Bldg. Corp., Magnet Equipment Bldg., 401 Cranbury, Trenton, 2 story, 140 x 200 ft. and 50 x 60 ft., brick veneer, with block and warehouse and office, to Lewis Bowers & Sons, Inc., 180 Nassau St., Princeton. $250,000.

N. J., Trenton — FACTORY, Yardley Rug Mills, Inc., Whitehead Rd. 60 x 260 ft. factory addn., to Lewis C. Bowers & Sons, Inc., 180 Nassau St., Princeton. $100,000. Raymond A. Bowers, 180 Nassau St., Princeton, archt.

Okla., Oklahoma City — PLANT — Mid-Continent Distributing Co., 123 N. W. 23 St., 400 x 500 ft. mfg. plant and general shops, N. 41 St. and Santa Fe Ave., to Bowen Constr. Co., 1 N. E. 26 St. $475,000. Awarded 2/28. Layton, Smith & Summerville, 1416 N. Broadway, Zone 2, archts.

Pa., Pittsburgh — MANUFACTURING — Howard Co., 6401 Butler St., 1 story, 100 x 160 ft. mfg. bldg., 62 Butler St., 1 story, 100 x 160 ft. mfg. bldg., to Aug. Anderson. $200,800.

Tenn., Memphis — SALES and SERVICE — Joyce Motor Co., 1 story sales and service bldg., 10 N. 3 St., to Bowen Constr. Co., 1089 Getway Ave. Approx. $100,000.

Tex., Garland — WAREHOUSE, etc. — Wall Supply Co., 2001 N. Lamar St., Dallas, structural steel warehouse and office, to Acme Constr. Co., 1 story, 60 x 200 ft., with specified protective steel roof and wall coating, to Consolidated Western Steel Corp., Dallas. $285,000. CD 4/24.

Tex., Houston — STORAGE, etc. — H. J. Cohen, San Jacinto and Texas St., storage and warehouse, to Approx. $75,000.

Ont., Toronto — BUILDING — Dunlop Tire & Rubber Goods Ltd., 820 Queen St. E., 2 story, 80 x 270 ft. factory, to Dominion Bldg. Co., 21 St. A. W. Robertson Ltd., 47 Bloor St. W. Approx. $350,000. F. A. Dowell, 391 Bay St., archt.

Que., Cowansville—PLANT. Rock Fire Mfg. Ltd., Dept. of, 1 and 2 story, 40 x 80 ft., reinforced. Plant extension and second bldg., 1 story, 40 x 133 ft., re-inforced structural steel. to R. E. Stewart Constr. Corp., 286 Wellington St., Montreal. Approx. $143,000. C. D. Goodman, 1616 Sherbrooke St. W., Montreal, archt. CD 3/29/49.

UNCLASSIFIED

BIDS ASKED

Fla., Polk—ELECTRICAL SYSTEM. B.A. 5/17—General State Auth., 18 and Hart Sts., Plant-bldg. re-constructing electrical sys. at Polk State. $165,430. Plans deposit $10. Morris B. Jones, 1616 Commercial Bldg., Tampa.

Que., Lake Memphremagog (Leadville)—WHARF. B.A. 5/17. Acting dep. sec. for minister, Bldg., Ottawa, Ont., wharf repairs. Approx. $14,000. Plans deposit $20. B. Eaton, 12 Dalhousie St., Quebec, Que.

Nebraska—RURAL DISTRIBUTION LINE. B.A. 5/15. Custer Public Power Dist., Broken Bow, Neb., 69-kv. transmission line from Broken Bow to West & Co. Sub., 16 mi. CD 3/16/49.

† Montana—PENSTOCK GATE HOISTS, etc. B.A. 5/23. Bureau of Reclamation, Denver, Colo., Fort Peck Power Plant, Glasgow, Mont., 2 penstock gate hoists, 1 auxiliary gate hoist, 1 trash rack cleaning machine, 1 gantry crane, 1 service

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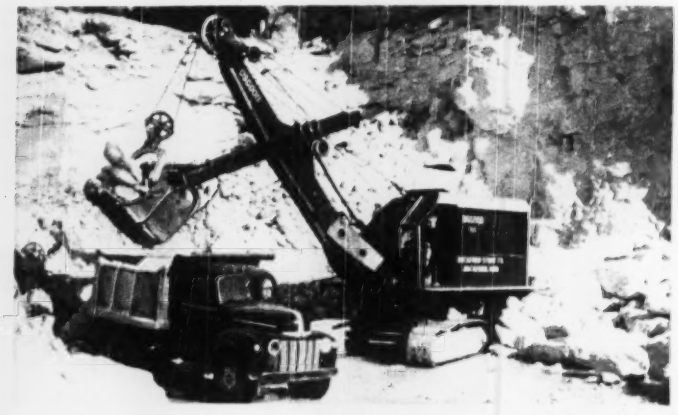

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PROPOSED PROJECTS

WATER SUPPLY

Kan., Russell—City, City Hall, WW, impvs., incl. elev. stor. tower, new tank on tower. Approx. $225,000. Wilson & Co., 223 N. Santa Fe, Salina, consult. engrs. CD 1-24.

Mass., Blackstone—Town, Bd. Selectmen, Town Hall, water sys. impvs., incl. pumping station, water mains, etc. $450,000. H. K. Barnes, 14 Beacon St., Boston, engr.

Mo., Sikeston—City, Municipal Utilities, municipal water sys., city wtr., WW, extns., impvs. Approx. $450,000. Howard & Aaron, 308 Olive St., St. Louis, 2 cons. engrs.

N. C., Carthage—Town, A. L. Barnes, mayor, Clerk, proposed bond, WW, impvs., incl. new well to Little River and new tower on site. $135,000. Harper, Ramey & Associates, 1401 Main St., Columbia, S. C., consult. engr.

▲ N. C., Raleigh—City, Roy Braxton, engr., Raleigh, issuing June 6 bonds, authorized by voters, for providing addl. 2 m.g.d. raw water supply, repairing and painting elev. stor. tank and mains, extns., etc., $275,000. Addl. bonds, $35,000; revolving water tank, northwest part of city, $245,000; new water tower, southeast part of city, $100,000; and another water tower, southwest part of city, $100,000. Bonds to be sold in July. $765,000.

Okla., Bethany—City, voted bonds, reservoir, water supply, $298,000. Hudgins, Thompson & Ball, 1102 W. Main, Oklahoma City, consult. engrs. CD 2-3.

Tex., Abilene—City, voted bonds, water supply, $100,000; water supply, $200,000; water storage, $150,000; rehabilitation and new mains, etc., sys., $550,000.

Tex., Highlands—Harris County Water Control & Improv. Dist. 1, Highlands, voted bonds, WW sys. impvs., extns., $235,000. CD 2-21.

Tex., Lancaster—City, voted bonds, WW, $300,000. Milmer Hunter, 6403 Bob O-Link St., Dallas, consult. engr. CD 4-17.

Wash., Aberdeen—City, City Hall, steel pipe line to reservoir, existing line, $463,700. N. L. Salmon, water supt. CD 2-10-49.

Ont., Forbes (Postal Dist. Ottawa)—Govt. of Canada, National Research Council, extend water main along Montreal Rd., $150,000. Dept. P. Work, Hunter Bldg., Ottawa.

Ont., Niagara Falls—City, water sys. impvs., incl. duplicate pipe line from Chippawa to Niagara Falls, increasing pumping capacity at filtration plant at Chippawa, intake, new pumps. Approx. $500,000. W. S. Lee, C.E. owner engr.

SEWERS, WASTE DISPOSAL

Ark., Manila—City, sewerage sys., $124,000. Dickinson & White, 115 Spring St., Little Rock, consult. engrs.

Calif., Los Angeles—Bd. Supvrs., Los Angeles Co., 6-2 Hall of Records, sanitary sewers in Sheet St., Pico, $108,300; sanitary sewers, Whittier Blvd., Palo, $69,800. C. E. Arnold, engr.

Mass., Newburyport—City, Dpt. of Sewerage, treatment plant, $550,000. Metcalf & Eddy, 14 Beacon St., Boston, engrs.

Mo., Glendale (St. Louis 22)—P. O. City Hall, City Hall, 424 N. Lindbergh Blvd., $400,000 bond election June 6, storm sewerage sys. Fred Hirth, city engr. CD 10-13-49.

Mo., St. Louis—City, Frank J. McDevitt, pres. Bd. of Public Service, 12th floor, 12 and Market Sts., Zone 1, sanitary sewers, $840,000. Harry Brown, dir. Dpt. Streets & Sewers, 329 City Hall, 12 and Market Sts., Zone 1, engr.

N. Y., Port Washington—Port Washington Sewer Corp., Main St., sewage treatment plant and sewers between Harbor Rd. and Shore Front Rd., $965,000. Clinton Cowdin, 244 Main St., consult. engr. CD 4-3.

▲ N. C., Raleigh—City, Roy Braxton, engr., Raleigh, 2 sewage treatment plants, Walnut Creek and others on Crabtree Creek, $960,000; extns., outfalls on Crabtree and Walnut Creek, $400,000. CD 2-27-50.

Tex., Highlands—Harris County Water Control & Improv. Dist. 1, Highlands, voted bonds, sanitary sewer impvs., $165,000; sewage disposal plant units, $44,573. CD 4-24.

Tex., Houston—Harris County, Court House, 3rd fl., storm sewers, $50,000; sanitary sewers, $70,000; 220 acre tract at Tanner Rd. Hwy. 59, Pitner, Jr. Bldg., Travis St., consult. engr.

Tex., Pasadena—Corporation, c/o Herbert Tatar, c/o Tatar Lumber Co., Shaver St., storm sewers, $70,000; sewers, $60,000; storm sewers, drainage, on 133 acre tract south of High School, A. B. Moore, Pasadena, consult. engr.

Tex., Wichita Falls—City, sanitary sewer plant addn., $600,000. Joe E. Ward, 549 Nacol Bldg., consult. engr. CD 10-26-49.

Alta., Blairmore—Town, sanitary sewerage sys. and sewage disposal plant, $100,000. J. H. Davis, Calgary, engr.

▲ Ont., Hamilton—City, J. F. Berry, c.e., storm sewers on Mountain Top, $3,500,000. Proctor, Redfern & Laughlin, 11 Jordan St., Toronto, engrs. CD 11/5/49 e.

(Continued on page 100)

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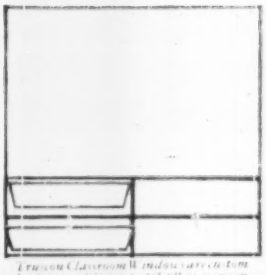

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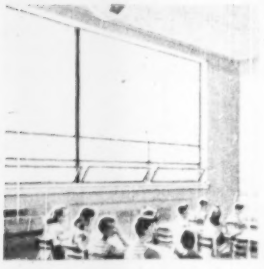

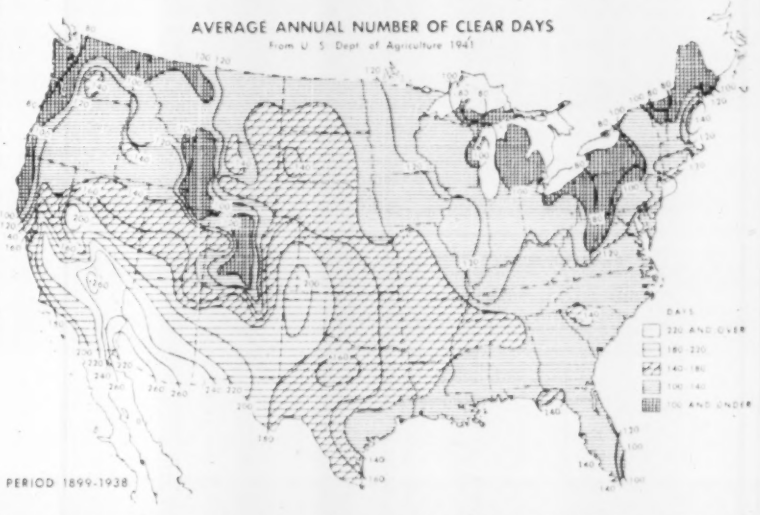

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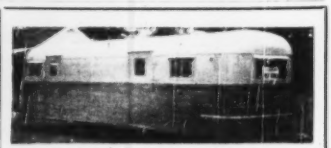

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(Continued from page 98)

Ont., Islington—Etobicoke Twp., Islington, storm sewers for Alderwood Area, $170,000. F. MacArthur, 444A Dundas St., engr.

Sask., Wilkie—Municipality, sewers, $105,000. CD 8-25-50.

Yukon Territory, Whitehorse—Municipality, sewerage sys, $300,000.

BRIDGES

Tenn., Maryville—Blount Co., c/o George D. Roberts, judge, Maryville, replacing bridge over Little River near Rockford, $130,000.

Tex., Abilene—City, motion urged, mayor, voted bonds for, $200,000.

Wash., Seattle—[illegible] County, city limits, Tyrwhitt concrete-bridge [illegible] for [illegible], $110,000. [illegible] Evans, co. engr.

▲ Wis., Milwaukee—City, Juneau Ave. bridge, $1,300,000. Gen. C. Aspinwall, bridge engr. CD 1-24-49.

Manitoba—Province of, Manitoba Highway, reinforced continuous vehicular roadway bridge, approach spans on Hudsons Bay Rd. over Saskatchewan River, The Pas, $100,000. [illegible] bridge over Winnipeg River, Pine Falls, Power Development Proj., Pine Falls, $150,000. Dept. of Mines, Winnipeg, engr.

Ont., Ottawa—Municipality, replacing No. [illegible] at intersection of railway and Stevenson Rd., $125,000.

STREETS AND ROADS

Calif., Fullerton—City Council, $367,000 bond issue, [illegible] June 7, for street improvements, [illegible] engr.

Calif., Los Angeles—Bd. of Supervisors, Los Angeles, [illegible] of [illegible] county, between Pomona & Pt. Arguello, Sta. [illegible] Lower Azusa Rd., El Monte, $62,500. C. E. Arnold, co. engr.

Neb., Lincoln—City Council, [illegible] paving, [illegible] $80,000; [illegible] $25,000; street widening, $4,000. D. C. Erickson, city engr.

Oklahoma—[illegible] by [illegible] Oklahoma Co., [illegible] Rd. [illegible] $700,000. [illegible] Mc[illegible], engr.

Washington—[illegible] Pacific Co., [illegible] Hy. [illegible] Bridge No. [illegible], $450,000. W. A. [illegible] engr.

Wash., Mount Vernon—[illegible] Rd. [illegible] $350,000; [illegible] 2 mi. Avon-Freeway, $90,000. [illegible] Wilbert, co. engr. CD 1-17-50.

Wash., Seattle—[illegible] County, [illegible] Zone 4, [illegible] Lake Ave., [illegible] $56,000; [illegible] Military Rd., $101,300; [illegible] Rd., $136,400; [illegible] $49,800; [illegible] 142nd St., $77,000; [illegible] Perkins Lane Rd., $27,000. D. J. Evans, co. engr.

N. S., Woodstock—Municipality, street paving, $150,000. F. [illegible] Wightman, Amherst, N. S., engr. CD 1-23-46.

Ont., Ottawa—City, paving various streets in Manor Park subdivision, Avalon Crescent, Rideau Heights, Arundel and Delmar Aves., Kenny, Dashwood and Fairbairn Crescents, Appin, $125,000. H. [illegible] c/o owner, engr.

EARTHWORK, WATERWAYS

† Calif., Redwood City—City, City Hall, defeated $480,000 bond issue, impv. Redwood Creek, Proj. 1, Alameda to [illegible] Hwy. 101, [illegible] engr., and G. M. Jam, City Hall, city engr. CD 4-27.

AIRPORTS

▲ Fla., Miami—TERMINAL—Dade Co., Courthouse, plans by Howard & Conner, 223 S. W. 1 St., terminal bldg. at Miami International Airport, $2,000,000. CD 7-27.

Kan., Leavenworth—AIRPORT IMPROVEMENTS, [illegible] airport, $140,000. A. N. Mills, city engr.

Neb., North Platte—AIRPORT IMPROVEMENTS, [illegible] by [illegible] $130,000. [illegible] Deane, airport improvement engr.

Tex., Abilene—[illegible] $300,000.

LATIN AMERICA

Mexico, Ciudad Juarez—Municipal Govt., [illegible] N. Mex. [illegible] $750,000. [illegible] Cia. Mexicana Viaducto, sewer, [illegible] $400,000.

Mexico, Guadalajara—Commercial [illegible] S. A., [illegible] refrigeration factory, $400,000.

Mexico, La Paz—Fomento Hotelero de Baja California, S. A., [illegible] 1220, Mexico, D. F., plans hotel, resort, featuring one or more 100-room hotels, bungalows, restaurants and amusement centers, $2,000,000.

Mexico, Mexico City—Bruce Refrigeration Products, S. A. Masaryk 2, Mexico, D. F., c/o Alberto A. Sepulveda, engr., plans electric refrigerator factory, $400,000.

Mexico, Mexico City—Purificadores y Filtros Aztlan, S. de R. L., Lago Ginebra 33, Mexico, D. F., plans water purifier factory, $300,000.

Mexico, Mexico City—Textex, S. A., Laguna de Mayran 413, Mexico, D. F., plans steel and formica factory, $400,000.

Mexico, Monterrey, Mexico—Govt., Secretaria de la Defensa Nacional, Mexico, D. F., plans military city, $750,000.

PUBLIC BUILDINGS

▲ Ala., Mobile—HOUSING—Mobile Housing Board, c/o Henry Hoge Johnstone, archt., Alsop First National Bank Bldg., Mobile, 700 housing units, Acorn, $4,000,000. J. B. Converse & Co., Inc., 326 St. Joseph St., engrs., CD 4-7.

Calif., Campbell—HIGH SCHOOL—Campbell Union High School Dist., 251 S. Winchester Rd., Campbell, $950,000 bond election, May 16, Fred Langhorst, clk., CD 4-1 Mo.

Calif., Eureka—SCHOOL—Eureka School Dist., 2nd St. and Burke, $639,000 bond election, May 17, elementary school.

▲ Calif., Fresno—SCHOOL—Fresno Union High School Dist., Fresno, $9,925,000 bond election, June 6, 2 junior high schools, senior high school, post elementary school.

Calif., Oroville—SCHOOL—Oroville Union High School Dist., Oroville, $750,000 bond election, [illegible], archts., CD [illegible].

Calif., Santa Paula—SCHOOL—Santa Paula Elementary School Dist., $500,000 bond election, May 19, [illegible], archts., CD [illegible].

Calif., Walnut Creek—HIGH SCHOOL—[illegible] High School Dist., Lafayette, $900,000 bond election, [illegible], archts., CD [illegible].

▲ Conn., Bridgeport—SCHOOL—Bridgeport Housing Authority, Kennedy Dr., Trumbull St., Dewey St., Ward St., Waterview Ave., Ellsworth Ave., Pleasure Beach Rd., Ellsworth Ave. and Pleasure Beach Rd., 2 story, 1 and 2 family, brick and frame, 200 units,

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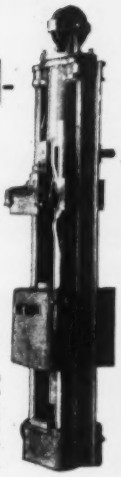

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▲ N. C. Candler—SCHOOLS—Bd. Comrs. Buncombe Co. (P. O. Asheville), plan bond election Nov. 7 on $5,500,000 bonds for new bldgs. and modernization of county schools, $4,000,000; City, $1,500,000. CD 12-22-49.

▲ N. C. Goldsboro—HOUSING—Goldsboro Housing Auth., Goldsboro, plans by W. B. Griffin, 405 N. Jessup St., 275 housing units. Approx. $2,500,000. CD 4-20-50.

▲ N. C. Lexington—SCHOOLS—Bd. Comrs., Davidson Co. (P. O. Lexington), plan bond election Nov. 7 on $3,500,000 bonds for new schools, town of Lexington, $1,000,000; rural schools, $1,800,000; town of Thomasville, $700,000.

▲ N. C. Raleigh—SCHOOLS—Bd. Comrs. Wake Co., also P. Swain, chm., Raleigh, voted bonds, schools, $4,000,000. CD 3-16-50.

▲ N. C. Winston-Salem—HOUSING—Winston-Salem Housing Auth., c/o Northup & O'Brien, archts., Reynolds Bldg., 370 housing units for Negroes. Approx. $1,000,000. CD 1-19-50.

▲ O., Youngstown—SCHOOLS—Bd. Educ., State and Wilson Sts., plans by P. Ray & Brooks Rice, Wick Ave. and Lincoln Ave., 1,250,000 plans by John Eberhard, 211 N. Ohio Ave., 12 room addn. to Woodrow Wilson High School, etc., $700,000. CD 5-11-49.

Okla., Muskogee—SCHOOLS—Bd. Educ., Muskogee, voted bonds, ... $600,000. ... Boyd Zarnow, Barnes Bldg., Archt. CD 4-7-...

Pa., Danville—CAFETERIA—General State Auth., 18,000 more sts., Harrisburg, plans by Lacy, Atherton & Davis, Hotter-Lacy Bldg., Wilkes-Barre, archts., cafeteria bldg. at Danville State Hospital, $435,391. A. F. Jones, Harrisburg, engr. CD 5-11-...

Pa., East Stroudsburg—DORMITORY—General State Auth., 18 and Herr Sts., Harrisburg, plans by Power & Hoffer, 2 and Vannie Sts., Stroudsburg, archts., dormitory, Shawnee Hall, at East Stroudsburg State Teachers College, $525,000. A. F. Jones, Harrisburg, engr. CD 11-...

Pa., Torrance—NURSES' HOME—General State Auth., 18 and Herr Sts., Harrisburg, plans by Sorber & Hoone, First Natl. Bank Bldg., Greensburg, archts., nurses' home at Torrance State Hospital, $600,000. A. F. Jones, Harrisburg, engr. CD 7-...

▲ Wash., Walla Walla—GYMNASIUM, etc.—State Bd. of Control, Olympia, voted $4,000,000 bonds, Nov. 7, including $500,000 for gymnasium, $1,000,000 for replacement of four old barns, $1,000,000 for art building, Whitman College, and $1,500,000 for new cell block, State Penitentiary. CD 4-27-50.

▲ Alaska, Juneau—TERRITORIAL OFFICES—Territory of Alaska, Juneau, Territorial Office Bldg., $1,260,000.

Man., Winnipeg—LIBRARY—University of Manitoba, Fort Garry, Dept. P. Wks., Winnipeg, plans by Green, Blankstein & Russell, 333 Donald St., 3-storey library. Approx. $850,000. CD 12-21-49.

N. S., Dartmouth—NAVAL RESEARCH—Govt. Canada, Ottawa, Ont., plans by Dept. National Defence, Ottawa, Ont., Naval Research Bldg., $490,000. Canadian Commercial Corp., 70 Lyon St., Ottawa, Ont., engrs.

▲ N. S., Halifax—HOSPITAL WING—Children's Hospital, Halifax, 100 bed hospital wing, $1,000,000.

N. S., Halifax—BUILDING—Province of Nova Scotia, Halifax, plans by D. A. Webber, 103 Granville St., liquor control board bldg., Granville St., $800,000. CD 1-...

Ont., Toronto—BUILDING—Province of Ontario, Toronto, plans by Mathers & Haldenby, 15 Toronto St., Toronto, parliament buildings, $400,000. Dept. P. Wks., Toronto, engrs.

Que., Cowansville—POST OFFICE—Govt. of Canada, Ottawa, Ont., post office, $400,000. Dept. P. Wks., Hunter Bldg., Ottawa, Ont., engrs.

COMMERCIAL BUILDINGS

Ill., Chicago—OFFICE—American National Bank & Trust Co., trustee, Rush and Ontario Sts., plans by Loucheim & Fiser, 225 N. Michigan St., Zone 1, 5-story office, $400,000.

Ill., Chicago—HOTEL EXPANSION—Bryn Mawr Hotel, 5550 N. Kenmore St., Zone 40, plans by Alexander L. ... 2 W. Washington St., Zone 2, 2 to 12 story ... concrete block hotel, expans. $500,000.

▲ Ill., Chicago—APARTMENT—University of Chicago, 59th and Maryland Sts., plans by Philip B. Maher, 1 N. LaSalle St., Zone 12, 225 unit apartment for ... $2,500,000.

▲ Ill., Chicago—HOSPITAL—University of Chicago, 63rd and Maryland Sts., Zone 12, plans by Skidmore, Owings & ... 33 W. Monroe Ave., Zone 3, 6 story cancer ... hospital, $3,500,000.

Md., Baltimore—OFFICES—Wills Construction Co., S. L. ... and others, 100 Court Square Bldg., ... & Assoc., 2119 Maryland ... 4 story, 80x92 ft. story, bricks, brick ... Est. cost $350,000.

N. Y., Brooklyn—APARTMENT—Terrace Properties, Inc., ... Ave., plans by George A. Mil... New York, Zone 16, 6 story apart... 11 ... and 102-112 First Pl., $750,000.

N. Y., Far Rockaway—APARTMENT—Kingsley Gardens, ... Sutton & Bernard Sugarman, 183 Pierrepont ... Bldg., and 16 Ave., $630,000.

N. Y., Forest Hills—APARTMENT—Austin St. Constr. ... Engineering Layout, 160 Fifth Ave., New York, 3 ... apartments, ... Austin St. and 69 Dr., $600,000.

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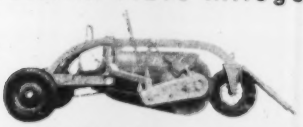

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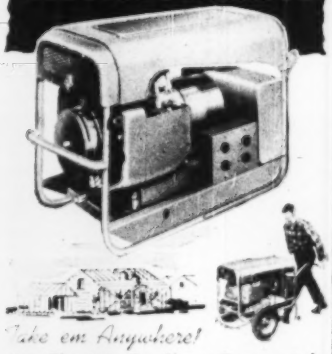

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▲ N. Y., New York—APARTMENTS—Madison Ave. and 79th St., 12 story, ... Madison Ave., ... Approx. $4,500,000.

N. Y., New York—APARTMENTS—Madison Ave. and ... Ave., ... Approx. $630,000.

▲ N. Y., Woodside—APARTMENTS—... Ave. and ... Ave., ... Approx. $1,470,000.

▲ ... Approx. $1,500,000.

Pa., Chester—APARTMENTS—... Approx. $260,000; plans by Frederic A. ...

Pa., Greensburg—... Approx. $250,000.

▲ Tex., Houston—... $7,500,000.

Tex., Houston—... $750,000.

▲ Tex., Houston—... $1,200,000.

▲ Tex., Houston—... $1,000,000.

▲ Tex., Pasadena—... $4,250,000.

▲ Tex., San Antonio—... $1,000,000.

▲ Wis., Appleton—... $2,500,000.

Wis., Hillsboro—HOSPITAL—St. Joseph's Memorial Hospital, Order of Sisters of St. Francis, plans by Dinzent & Bergquist, 297 Jones St., Dubuque, Ia., hospital, $433,000.

N. S., Halifax—COLLEGE—Mount St. Vincent College Admin. Halifax college, $500,000.

Ont., Scarborough—ORPHANAGE—Reverend Sisters of St. Joseph, St. Clair and Bathurst Sts., orphanage, on 17 acre site E. St. Clair St., $600,000.

Ont., Woodstock—HOUSING—Huron Development Co., Woodstock, housing development on 15 acre site, $500,000.

Que., Montreal—OFFICE—Montreal Trust Insurance Co., 625 Burnside St., office, $500,000.

▲ Que., Verdun—HOSPITAL—Protestant Hospital for ... Ave. LaSalle Rd., hospital for T. B. patients, $1,000,000.

Sask., Regina—BANK—Bank of Montreal, 119 St. ... Street at W. Monroe and Franklin Sts. to Wells & Moore, 105 Broadway Ave., Winnipeg, Man., 10 story, ... & Export, out Main Street, Bank of Nova Scotia, Eleventh Ave. and Scarth St., Approx. $400,000.

INDUSTRIAL BUILDINGS

▲ Calif., Los Angeles—PLANT, etc.—Continental Can ... Pacific Ave., 2 story plant and warehouse, $2,000,000.

Calif., Los Angeles—WAREHOUSE, etc.—Dennis Construction Co., Meyer & Eyers architects, 1010 Monterey Pass Rd., warehouse and store, $600,000.

▲ Ia., Fort Dodge—PLANT—United States Gypsum Co., Fort Dodge plant addns., $1,000,000.

Mo., Afton (St. Louis 23 P.O.)—PLANT—White-Rodgers Electric Co., 1209 Cass Ave., Zone 6, 1 story, ... brick, steel, stone, ... for mfg., ... on 31 acre tract on north side of Reavis Barracks Rd., east of St. Louis-San Francisco Ry. near here, $500,000.

▲ Mo., St. Louis—GARAGE—Syndicate, c/o Louis D. Stieber, 2715 Union Blvd., Zone 8, 2-level 750 car capacity underground parking garage, 2-story and basement, 12, 13, Market and Fifth Sts., Approx. $1,000,000.

▲ O., Cincinnati—PLANT—The Formica Co., 4619 ... Street, 100,000 sq. ft. bldg. for performing ... work connected with laminated plastic, etc., $1,000,000. Total expansion $2,000,000.

▲ Va., Roanoke—PLANT—Lone Star Cement Corp., 342 Madison Ave., New York 17, N. Y., cement plant with annual capacity of 1,500,000 bbls., $6,000,000.

▲ Wash., East Stanwood—CANNERY—Morris-Mirk, ... (vegetable) canning factory, $2,000,000.

▲ Ont., Chatham—PLANT—American Can Co., Chatham, 1 story, ... concrete and ... Richmond St. W., Approx. $1,500,000.

Ont., Oshawa—PLANT—... Approx. $346,000.

Ont., Toronto—FACTORY—... Bldg., ... Ave., ... Bldg., ... Ave., ... Bldg., ... Ave.,

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CONSTRUCTION REPORTS–Second Section

WATER SUPPLY

BIDS ASKED

Que., Causapscal—B.A. ... Water works ... $122,000. ... engr. Quebec City, engrs. CD 2-2-45.

SEWERS, WASTE DISPOSAL

BIDS ASKED

Que., Causapscal—B.A. ... work ... Minn., Minnesota Lake ... Ia., Storm Lake ... Calif., Los Angeles ...

LOW BIDDERS

Calif., Oakland ... $737,154. ... CD 4-7-4.

BRIDGES

BIDS ASKED

STATE HIGHWAY LETTINGS

May 17
Connecticut
May 16
Maryland
Massachusetts
May 18
Indiana
May 19
Illinois
North Dakota
May 25
California

N. Y., New York ... Zone 31, electrical ... work ... Oregon and Washington ...

LOW BIDDERS

▲ New Jersey ... $5,326,890 ...

▲ New Jersey ... $7,698,810 ...

North Carolina ... $82,597 ... $62,402 ... $537,654 ... $310,007 ... $271,436 ...

STREETS AND ROADS

BIDS ASKED

STATE HIGHWAY LETTINGS

May 15
Connecticut
May 16
Maryland
Massachusetts
May 17
Louisiana
May 18
Indiana
Nevada
Virginia
May 19
Illinois
North Dakota
May 24
California
May 26
Pennsylvania

Minn., Waseca ... $4,600 ... $10,000 ...

O., Toledo ... $129,105, $108,214 and $140,994 ...

Minn., Wadena ...

Okla., Bristow ...

Tex., Houston ...

Tex., Pasadena ...

LOW BIDDERS

▲ Massachusetts ... 224 ... $2,471 ...

New Hampshire ... $286,853 ...

CD 4-18.

North Carolina ... $42,500. ... $63,470. ... $59,591 ... $64,870. ... $111,319 ... $53,335. ... $57,671 ...

CONTRACTS AWARDED

Mississippi ... $80,964 ... $157,535, ... $526,141 ...

EARTHWORK, WATERWAYS

BIDS ASKED

† California ...

LOW BIDDERS

▲ California ... 2) $1,582,866. ... CD 4-27.

† California ... Angeles, $865,965. CD 4-19.

AIRPORTS

BIDS ASKED

† N. Y., Harrison ... $150,492. ...

LOW BIDDERS

Wis., Milwaukee ... $684,291. ... CD 4-4.

CONTRACTS AWARDED

▲ N. Y., Inwood ... $1,183,000. ...

LATIN AMERICA

Bolivia, Santa Cruz ...

PUBLIC BUILDINGS

BIDS ASKED

N. Y., Gloversville ...

Ill., Carbondale ...

Ill., De Kalb ...

† N. Y., Brooklyn ... Plans deposit $10.

N. Y., Sidney ...

N. C., Mount Airy ...

Col. York. Groves & Toy, Piedmont Bldg., Charlotte, archts. CD 3-10-47

Okla., Goodwell—DORMITORIES—B.A. 5/18—Pachardie A. & M. College Goodwell, 2 dormitories, $440,000. Plans deposit $25 each. Soney, Hill & Soney, 804 N.W. 36 St., Oklahoma City, archts.

Okla., Langston—AUDITORIUM—B.A. 5/19—A. & M. College State Capitol Oklahoma City, Auditorium-west College A. & M. College, $210,000. Plans deposit $25. Nolen & Mayer, 1400 Natural Gas Bldg., Oklahoma City, archts. CD 3-27-50

Okla., Stillwater—MEAT LABORATORY—B.A. 5/18—Oklahoma A. & M. College, meat laboratory-sanitary Oklahoma A. & M. College, $150,000. Plans deposit $25, refund on 3 storage bldg. Layton, Forsyth & Pugh, 1400 N. Walker, Oklahoma City, archts. Engineer & Thompson, Oklahoma Natural Gas Bldg., Oklahoma City, engrs.

† Tex., Carthage—MOTOR VEHICLE STORAGE—B.A. 5/19—State of Texas, Adjutant General's Dept., C/o Lt. Col. C. F. Stovall, Camp Mabry, 52x110 ft. masonry, concrete, metal motor vehicle storage. Inv. No. NG-41-242-50-6. Approx. $50,000.

† Wash., Bangor—[illegible]—B.A. 5/18—Office of Chief of Construction, Navy Dept., Wash., D.C., 2611 W. Wheeler St., Seattle, Exact 6 frame shelter for U. S. Naval Ammunition Depot, Bangor, Wash. Plans deposit $10. CD 3-27-50

Calif., San Francisco—LABORATORY—B.A. 5/19—Bid Request, University of California, Berkeley, 2 story, partial ground floor, Radiological Laboratory at University of California Hospital, unit 3 story hydraulic elevator. Approx. $250,000. Plans deposit $25, refundable. Plans may be seen in San Francisco, Sumner & Maier, 1 Montgomery St., engrs.

† N. M., El Vado—HOUSING—B.A. 5/19—U. S. Eng., Box 1500, Albuquerque—Training Camp Site 2, housing, utilities, water, sewer, paving, storm sewer, steam heating and attic roof sys., $700,000. Invit. No. Eng. 29-005-50-38. Plans deposit $50 each. CD 4-6

Tex., Cleburne—MOTOR VEHICLE STORAGE—B.A. 5/19—State of Texas, Adjutant General's Dept., c/o Lt. Col. C. Stovall, Camp Mabry, 52x110 ft. masonry, concrete, metal motor vehicle storage. Inv. No. NG-41-242-50-6. Approx. $50,000.

Tex., Borger—MOTOR VEHICLE STORAGE—B.A. 5/22—State of Texas, Adjutant General's Dept., c/o Col. C. Stovall, Camp Mabry, 52x110 ft. masonry, concrete, metal motor vehicle storage. Inv. No. NG-41-242-50-6. Approx. $50,000.

Tex., Lubbock—AGRICULTURAL ENGINEERING—B.A. 5/19—Texas Technological College, Lubbock, Agricultural Engineering, $400,000. Plans deposit $25. Mayfield & Kirby, 19 St. and Dixie Dr., archts. CD 3-6-50

Tex., Baytown—COLLEGE—B.A. 5/24—Goose Creek Independent School Dist., Baytown Lee Junior College, 42,000 sq. ft. administration, instruction, gymnasium steel frame, $360,000. Plans deposit $50. Robert Vonkeer & Assoc., 1202 Heights Blvd., Houston, archts. CD 7-15-49

† Wash., Fort Lewis—QUARTERS—B.A. 5/19—U. S. Army, 1 Army-Way, Seattle, Zone 4, one two-family, 8 one family type quarters. Serial No. 1-5-51-44. CD 4-13-50

Calif., San Mateo—HIGH SCHOOL—B.A. 5/25—San Mateo Union High School District, San Mateo, 1,500 pupil Hi-Boy High School, approximately $500,000. Plans deposit $25, refunded after receipt of bid. Plans may be seen in San Mateo, Howard Ave., Burlingame, archts. Bid 3-13-50

† N. M., Las Cruces—TECHNICAL OFFICE—B.A. 5/24—U. S. Army Corps of Engrs., Albuquerque technical office laboratory and shop bldg., White Sands Proving Ground, NAV 46, Serial No. Eng. 29-005-50-44. CD 4-13-50

▲ Tex., Corsicana—HOSPITAL—B.A. 5/24—Navarro County Hospital Dist., Corsicana, 2 story brick and tile hospital, $1,250,000. Plans deposit $25, refundable. Clarkson, Hall & Nail, Box 8169, Fort Worth, archts. CD 4-13-50

† Wash., Tumwater—ARMORY—B.A. 5/23—U. S. Army, 4218 E. Marginal Way, Seattle, Zone 4, one two-story, 1 company, Armory, Tumwater, etc., Serial No. [illegible] CD 4-17-50

LOW BIDDERS

Calif., Berkeley—[illegible]—Bid 5/16—Chester H. Jones, 2111 Bancroft Way, Berkeley, Apt. 2, 2 story [illegible] Sacramento.

Calif., Salinas—[illegible]—Bid 5/16—Ralph A. Wilson Co., 1111 Howard St., San Francisco, Apt. 2, 1 story [illegible] Salinas.

Calif., Salinas—[illegible]—Bid 5/16—Ralph A. Wilson Co., 1111 Howard St., San Francisco, Apt. 2, 1 story [illegible] Salinas.

▲ Conn., Danbury—[illegible]—Bid 5/16—Charles Mancini & Sons, Inc., 1 Mancini Dr., Danbury, $1,064,000. CD 4-18-50

Kan., Russell—[illegible]—Bid 5/16—Ray Evans Construction Co., Russell, $551,000. CD 4-6

Md., Bethesda—[illegible]—Bid 5/16—Montgomery County Court House, Rockville, main brick concrete steel, limestone, stone veneer, 3 story, 4 wings, 2 high School Mass Ave. extended west of B. & O. R.R. Georgetown, from B. F. Harding, Hagerstown, $747,000. Plans from B. F. Harding, Hagerstown, Knox Knoes E. Bethesda, 227 Concord Ave. N.W. Wash., archts. CD 3-27-50

▲ Md., Hagerstown—HOSPITAL—Washington Co. Hospital, Key St., Apr. 25, 7 story, 6x412 ft. wing, 5 story, 3x62 ft., and 42x152 ft. nurses home and addition, brick, steel, Hood Jeffries Dyer, Inc., 905—20 St. N.W., Wash., D.C., $2,650,000. CD 3-28-50

▲ Mass., Boston—HOUSING—City of Boston Housing Auth., 230 Congress St., Apr. 21, 498 family unit, State aided housing Proj. Boston 200-3 Commonwealth Ave. Washington St. and U.S. Marine Hospital, Brighton, from C. J. Maney Co., 24 Dane St., Somerville, is $6,393,000. CD 4-19

▲ Mass., Boston—HOUSING—City of Boston Housing Auth., 230 Post Office Square, Apr. 27, 230 unit, Archdale Proj. Boston 200-5, Hyde Park, from Peterson Constr. Co., 25 First St., Cambridge, $2,467,140. CD 4-19

Mass., North Adams—HOUSING—City of North Adams Housing Auth., North Adams, Apr. 21, 65 unit frame housing, Phase Ave., Greylock Pk., Catherine and Hamlet Sts. from Benson County Co., 102 Hand St., Adams, $724,035. CD 4-13

▲ Mass., Taunton—[illegible]—Commonwealth of Mass., Dept. of Mental Health, 8 Ashburton Pl., Boston, Apr. 26, school for feeble minded addn., alterations, Proj. 28, M-51, Dunn, 2 from Gilbane Bldg., Providence, is $5,424,113. CD 4-26

† New Jersey—BUILDINGS, etc.—U. S. Eng., 180 Lafayette St., New York, 23, N. Y., bldgs., utilities, marine ways, Red Bank, No. ENG-30-075-50-37, from Morris Co., Inc., 921 G. Bergen Ave., Jersey City, $843,044. CD 3-13

▲ N. Y., Brooklyn—HOUSING, New York City Housing Auth., 63 Park Row, New York, Zone 7, Mar. 2, 1,000 unit general constr., Sect. 31, Farragut Houses, Proj. No. NYS-24, in area bounded by Navy, Gold, Jay and Nassau Sts., from [illegible], 25 W. 45 St., New York, Zone 19, $2,338,000. CD 3-27

N. C., Graham—HIGH SCHOOL, Alamance Co. Bd. of Education, Jeanette, bids Mar. 20, 12 room addn., L. B. $644,000. Will readvertise. CD 4-11 under LB

▲ Tex., Austin—CLASSROOM BLDGS., etc.—University of Texas, Regents, Austin, Apr. 27, Hogg Memorial Bellows Constr. Co., Box 2132, Houston, three 4 story reinforcement, hollow tile, brick, stone, $501,225. Bldg., pier and beam bldg., 2 story, $502,175. Bldg., 1 story, $504,000. Bldg., 2 story, [illegible] Robert E. McKee, 2 story, Inverness Rd., Dallas, 5 story, 1 basement, 1 story brick, hollow tile, stone, concrete, basement, 1 story concrete pier and beam, [illegible] conditioning, $482,427. CD 4-6

▲† Alaska, Fort Richardson—HOUSES—U. S. Eng., ARO, Elmendorf AFB, Anchorage, Wash., Anchorage, Apr. 27, 100 one family, 4 two-type houses, $ 96,507,504. From Frey & Frey, Inc., 1340 Admiral Blvd., Kansas City, Mo., $4,718,140. CD 3-24

CONTRACTS AWARDED

▲ Calif., Richmond—SCHOOL—Richmond Union High School Dist., 1108 Bissell St., Contractors Equipment & Supply Co., 225 Bush St., San Francisco, $1,536,000. Bids 3-30. CD 4-4, under LB

▲† N. M., Los Alamos—HOSPITAL—U. S. Atomic Energy Comm., Los Alamos, Hospital, Box 1663, Santa Fe, McKee, Inc., Box 1100, Santa Fe, $2,261,060. Bids 4-21. CD 4-26, under LB

▲ N. Y., Glens Falls—HIGH SCHOOL, Bd. Educ., Union Free School Dist. 1, Glens Falls, Apr. 4, Hyatt Bldg., to Waggaman & Gallery, Glens Falls, $1,262,500. Bids 4-12. CD 4-13

▲ N. Y., Utica—MEDICAL—SURGICAL Bureau, Contracts & Accounts, Albany, medical-surgical bldg., 11 story, to Merritt-Chapman & Scott Corp., 17 Battery Pl., New York, Zone 4, $3,786,000. Bids 4-22. CD 4-24, under LB

▲ Pa., Hollidaysburg—ADMISSION—General State Authority, Harrisburg, general contract, Admission Bldg., at Hollidaysburg State Hospital, to Thompson & Rhoads, Mercersburg, $1,449,000. Bids 4-19, awarded 4-27. CD Zone 27

▲ Tex., Austin—CLASSROOM BLDGS., Bd. Regents, University of Texas, Austin, 3 classroom bldgs., 1 pharmacy bldg., power plant addn., [illegible] Bldg., Bldg. No. 2-12, Wright Construction Co., Austin, $2,026,700. Bldg. No. 2-13, Wright Construction Co., Austin, $310,734. Bldg. No. 2-14, Austin Engineering Co., Austin, $247,017. Bids 4-21, awarded 4-24. CD 4-24, under LB

▲ Va., Richmond—[illegible]—Henrico County, Virginia Housing Authority, Richmond, 92 unit, Carver Proj. to [illegible] Co., Richmond, $928,680. Bids 4-24. CD 4-26, under LB

† Washington—BUILDINGS, etc.—U. S. Eng., 4218 E. Marginal Way, Seattle, Zone 4, buildings, access road, [illegible] grading, utilities, Serial No. Eng. 455-50-4, Ray Kaylor, P.O. Clallam Bay, Serial No. Eng. 455-50-4, Ray Kaylor, P.O. Clallam Bay, Awarded to Anderson-Zone 4, $860,501. Bids 4-24. CD 4-5, under LB

† Wis., Elkhorn—BARRACKS, etc.—U. S. Eng., 277 W. Wells St., Milwaukee 2, 2 story high school, Sumner Proj. Bd. Milwaukee 2, 2 story high school, Sumner Ave. to U. S. M. Cape & Co., Ltd., 620 Cathcart Ave., to [illegible], $827,240. Bids 4-4. CD 4-12, under LB

▲ Que., Montreal—HIGH SCHOOL—Protestant Central Bd., Montreal, 2 story high school, Sumner Ave. to U. S. M. Cape & Co., Ltd., 620 Cathcart, $1,787,913. Bids 4-3. CD 3-14

COMMERCIAL BUILDINGS

BIDS ASKED

Ont., Port Hope—MEMORIAL CHAPEL—B.A. About 5/15—Williams & Houlderby, archts., 16 S. Mary St., Trinity College School, Port Hope, memorial chapel for Trinity College School, Port Hope. Approx. $250,000

Ia., Vinton—HOSPITAL—B.A. 5/15-31—Regents, Veterans Memorial Hospital, 4 story hospital, $375,000. Weary, Kay & Harrison Shops Bldg., Des Moines, Weary & Harrison Shops Bldg., Des Moines, archts. CD 11/17.

Mo., Springfield—HOSPITAL—B.A. After 5/15—Burge Hospital, 400 S. Main St., private res-care hospital, $500,000. Howard & Ellerd, McDaniel Bldg., Springfield, archts. CD 11-12

Ga., Atlanta—CHURCH—B.A. 5/24—Morningside Baptist Church, Cox Thomas West Gardner, archts., Warner Bldg., Nashville, Tenn., church. Extended date CD 4-11

R. I., Providence—HOSPITAL—B.A. 5/16—Miriam Hospital, 91 Parade St., 4 story, 100 bed hospital, $750,000. Burgess & Tyler, 1022 Grosvenor Pl., Boston, archts. Bids 4-6 & May 45 Newbury St., Boston, archts. CD 11-2-49

▲ Mo., Springfield—HOSPITAL—B.A. 5/17—St. John's Hospital, 1235 E. Cherokee, Mercy Hospital, 2 story hospital, Carew & Hussey, engrs., steel hospital, [illegible] extension, 4 story house, Main and Cherokee Sts., Approx. $5,000,000. Maguire & Quick, 1 Park Sq., Boston, archts. Zone B, archts. CD 10-19-47

▲ N. Y., Hudson—HOSPITAL—B.A. 5/18—Columbia County Memorial Hudson Hospital, $1,500,000. Fuller & Hussey, 342 Fifth Ave., New York, Zone 10, archts.

▲ R. I., Providence—DORMITORIES—B.A. 5/18—Brown University, Prospect St., 4 story, bonded brick, steel, 1 story quadrangle, Thayer, George, Brown and Pierce, $4,250,000. Perry Shaw, Hepburn, Kehoe & Dean, 955 Park Square Bldg., Boston, Mass., archts. Deverdie, Kenney & Rice, 120 Tremont St., Boston, Mass., engrs. CD 4-14-48

▲ Tenn., Kingsport—HOSPITAL—B.A. 5/23—Holston Valley Hospital, Charles H. McCurdy, Chief Surgeon, Jackson Bldg., Kingsport, Ala., hospital, $1,500,000. CD 4-3

Ill., Chicago—MEDICAL OFFICE—Bids Asked—Daniel H. Perry & Associates, archts., 23 E. Jackson Blvd., 4 story, 50x100 ft. and 50x100 ft., 4 unit medical office, brick, $350,000.

▲ Ill., Chicago—HOSPITAL CENTER—Bids Asked—Trinity Properties, Inc., 30 N. Lakeshore Dr., shopping center, 3 story, George Grover, 67 Ave. Langley Pkwy., Chicago, archts., Nimmons & Nimmons, 33 W. Jackson Blvd., Zone 4, archts.

Ill., Evanston—[illegible]—Bids Asked—Cooperative apartment, 3 story, Jens Jensen, Marshall Hunt, Temple & Zimmerman, 141 W. Monroe St., CD Zone 3, archts.

Ill., La Grange—[illegible]—Bids Asked—High School, 4 story, [illegible] and stone and [illegible] Zone 2, archts. Sidney Hare, 134 N. LaSalle St., Zone 2, archts.

Tex., Fort Worth—APARTMENT—Bids Asked—J. W. Lowrey, 1600 Denton Hwy., 96 [illegible] of 1 to 3 bedroom units, Joe W. Lowe Insurance Agency, Electric Bldg., engrs., Fort Worth, archts.

▲ Tex., Fort Worth—[illegible]—Bids Asked—Stemmons Motor Co., Montgomery St., 102 [illegible] Zone 3, archts.

▲ Tex., Houston—[illegible]—Bid 5/16—A. E. Lowenberg, Lowenberg Bldg., 2502 Times St., 24,000 sq. ft. commercial bldg., Portsmouth St., $600,000. 14,000 sq. ft. commercial bldg., Greenbriar area, $400,000. CD 4-20

Tex., Houston—HOTEL—Bids Asked—Tex. Petroleum Co., 1 story, [illegible] roof, [illegible] Slack & Barton, engrs., Esperson Bldg., Houston, archts. CD 4-10

Tex., Houston—PARKING—Bids Asked—Transcontinental Pipe Line Corp., Pipe Line Corp. Bldg., 1 story, [illegible] steel office and [illegible] Bldg., 1 story, [illegible] steel office and [illegible] Bldg., 1 story, [illegible] steel office and [illegible]

N. Y., Woodside—CHURCH, rectory, parish house, Church, 45-20 45 St., Sanctuary, William J. Burge, 12 E. 46 St., New York, Zone 17, owner CD 4-28

O., Steubenville—DEPARTMENT STORE, J. C. Penney Co., Inc., Merchant Bldg., Dallas, Engineering Dept., Penney Bldg., New York, Zone 1, owner CD 4-27

Wash., Seattle—WAREHOUSE, Pacific Coast Co., 1900 First Ave., S., Seattle, Zone 4, owner CD 4-28

LOW BIDDERS

▲ Calif., San Diego—CLUBHOUSE, Balboa Park Activities Assn., Balboa Park, San Diego, Zone 1, owner; Frank Trepte, Comm. of Parks and Recreation, City Hall, San Diego. $3,820,235.

▲ Ia., Cedar Rapids—HOSPITAL, St. Luke's Methodist Hospital, 1026 A Ave., N. W., Cedar Rapids, Zone 3, owner; Rehmann Co., 113 E. Ave., N. W., Cedar Rapids. $1,310,000; $241,607.

N. D., Park River and Grafton—HOSPITAL, Park River Hospital Assn., Park River, Apr. 18, general contract, Engineer, Architect, Minot. $654,984.

O., Sandusky—HOSPITAL, Firelands Community Hospital, Inc., Venice Ave., Zone 2, owner; Hospital Bldg. Comm., 226 W. Market St., Sandusky. $784,647.

▲ Tex., El Paso—HOSPITAL, Mrs. Dan Sisler Memorial, Inc., Arthur Ave., El Paso, Apr. 24, general contract, 4 story, basmt., 200 bed maternity hospital, engineer, Robert E. McKee, Inc., Mission Hills, El Paso. $1,346,000; mechanical work, Hoag Heating & Plumbing Corp., 716 N. Florence St., El Paso. $417,000. CD 4-22

▲ Tex., Houston—WAREHOUSE, Foremost Dairies, Inc., 4824 W. Fifth St., Fort Worth, Zone 7, owner; Western Construction Co., 4824 W. Fifth St., Fort Worth. $320,000; Sprinkler work, Texas Sprinkler Co., Houston. $475,000; and electrical work, Electric Co., Houston. $360,000. $350,000. CD 4-21

CONTRACTS AWARDED

▲ Ala., Birmingham—[illegible] $1,500,000

▲ Ark., Pine Bluff—[illegible] $1,000,000

▲ Calif., Downey—[illegible] Approx. $1,344,000

▲ Calif., Gardena—[illegible] $1,177,500

▲ Calif., Los Angeles—[illegible] $2,424,900

▲ Calif., Redwood City—[illegible] $1,400,000

▲ Calif., San Francisco—[illegible] $2,000,000

▲ Calif., Torrance—[illegible] $1,900,000

▲ Calif., Whittier—[illegible] $1,464,447

▲ Del., Wilmington—[illegible] $1,150,065

▲ Fla., Hillsborough Beach—[illegible] $1,000,000

▲ Ill., Chicago—[illegible] $1,000,000

▲ Ill., Chicago—[illegible] $1,000,000

▲ Ia., Sioux City—APARTMENTS, Valley Park Apartments, Inc., 6 and Nebraska Sts., apartments, 51 Valley Court, Dr. 6 and Nebraska Sts., $1,000,000. William Nielsen Hubbell Bldg., Des Moines, owner

▲ La., Chalmette—HOUSING, Winston Brothers, N. Y., N. Y., general contractor, 180 houses to be built, Approx. $1,000,000

▲ Mass., Lexington—HOUSING, Preston Homes, Shapiro & Eagle, 6 Arlington St., Natick, two hundred 1 story, brick veneer, frame houses, $2,500,000

▲ Mass., Williamstown—LABORATORY, Williams College, Dr. H. Baxter Jennings, Williamstown, 2 and 4 story, brick, tile, concrete, steel construction, Architect, Cambridge. $1,360,000. Ira Wrigley & Son, Inc., Pittsfield, Mass., general contractor

▲ Mo., St. Joseph—APARTMENT, Ambassador Apartments, Inc., 2115 Frederick Ave., apartments, 2 story, brick, Architect, Engineer, Kansas City. $2,000,000. Everett-Jones Construction Co., Trust Bldg., owner

▲ Neb., Fort Crook—[illegible] Approx. $5,000,000

▲ N. J., Hackensack—[illegible] $1,000,000

▲ N. J., New Providence—APARTMENTS, Berkeley & Main Sts., apartments, 111 Garden Place, Hackensack, Architect, Engineer, New York, N. Y. $1,058,500. Klein & Kline, 244 W. 49 St., New York, N. Y., owner

▲ N. J., Trenton—RESIDENTIAL DEVELOPMENT, Revere Homes, Inc., Revere Homes, Inc., residential development, Architect, Engineer, Trenton. $2,500,000

▲ N. Y., Brooklyn—APARTMENT, Shapiro Eagle Corp., 6 story, brick, steel, reinforced concrete, Architect, Engineer, Lefcourt Realty Corp., 250 Park Ave., New York, N. Y. $1,500,000.

▲ O., Cleveland—HOTEL, Peter Grace, Inc., 1 story, brick, steel, reinforced concrete, Architect, Engineer, Hotel Cleveland, Inc., Cleveland. $1,800,000

▲ O., Lyndhurst—[illegible] $4,500,000

▲ O., West Carrollton—[illegible] $1,000,000

▲ Pa., Ambler—[illegible] $1,044,000

▲ Pa., Brownsville—[illegible] $4,000,000

▲ Pa., Chesterton—[illegible] $1,000,000

▲ Pa., Coraopolis—[illegible] $1,000,000

▲ Pa., Devon—[illegible] $1,000,000 John [illegible]

▲ Tex., Houston—[illegible] $1,053,000

▲ Wash., Spokane—[illegible] $1,000,000

▲ Wis., Neenah-Menasha—[illegible] $2,500,000

▲ Ont., Malvern, Toronto—[illegible] Approx. $1,250,000

INDUSTRIAL BUILDINGS

BIDS ASKED

Mass., Boston—GARAGE, Bids Asked, Fallon Garages, Inc., 1025 Market St., garage, 15 sts., $200,000. W. F. Schnurr, 22 [illegible] St., Detroit. CD 4-14.

N. D., Carrington—[illegible]

Del., Wilmington—[illegible]

Ill., Chicago—FACTORY, Bids Asked, Reliance Varnish Co., 4501 W. Hudson St., 2 story, 40 x 100 ft., factory, steel, $90,000. Shaw & Hedrich, 225 N. Michigan Ave., Zone 1, owner

Pa., Phila., GARAGE, Bids Asked, Fallon Garages, Inc., 1025 Market St., garage, 15 sts., $200,000. W. F. Schnurr, 22 [illegible] St., Detroit. CD 4-14.

SOON LETS CONTRACT

▲ Idaho, Boise—PLANT, Statesman Printing Co., 603 Main St., soon lets contract 3 story, basmt., 90x122 ft., newspaper publishing plant with steam heating, [illegible] $1,000,000. Architect, 2043 N. W. Jefferson Pl., Portland. CD 1/2/50

Ill., Kankakee—WAREHOUSE, General Foods Corp., Kankakee, soon lets contract 240,000 sq. ft. warehouse, $900,000.

CONTRACTS AWARDED

Calif., Azusa—BREWERY, Lucky Lager Brewery, Azusa, Inc., Azusa Ave., brewery, 1 story, brick, Bids, 206 San [illegible] $750,000. Meyer & Eyer, 626 Montgomery St., San Francisco, Archts.

La., New Orleans—BREWERY, Falstaff Brewing Corp., [illegible] brewery and bottling plant, addns., alterations, to Gerard J. French, 29 Baronne Bldg., $470,000. [illegible] CD 4-2

▲ O., Cleveland—FOUNDRY, Ford Motor Co., 1003 Lake Rd., Ashtabula, Mich., substructure of foundry, [illegible] $3,000,000. Albert Kahn Assoc., Architects, Detroit

▲ Pa., Corry—PLANT, Corry Jamestown Mfg. Co., Corry, 1 story, brick, steel, reinforced concrete, Architect, Engineer, 1104 Liberty Ave., Erie. Approx. $1,000,000. Shaw & Hedrich, 140 Cedar St., New York, N. Y.

▲ Pa., Lancaster—RESEARCH LABORATORY, etc.—Armstrong Cork Co., Liberty and Charlotte Sts., research laboratories and plant, Engineer, E. Rutan, Lancaster. Architect, Wm. Steele & Sons, 1211 Arch St., Phila. $1,500,000. Bids, 4-14. CD 4-14

UNCLASSIFIED

BIDS ASKED

N. S., Halifax—[illegible] CONCRETE PIERS, [illegible] Halifax Harbor. Approx. $75,000

† Colorado—[illegible] TRANSFORMER, [illegible]

† N. J., Fair Lawn—[illegible]

D., Toledo—[illegible]

† Fla., Green Cove Springs—[illegible]

† Pennsylvania—[illegible]

† Pennsylvania—[illegible]

† Va., Norfolk—[illegible]

† Colorado—[illegible]

† Nebraska—[illegible]

Federal Center, Denver, Colo., controlling station supervisory control and telemetering switchboard and equip. and carrier-current equip. for supervisory control and selective and continuous telemetering for Gering and Sidney substation and Kimball Tap, Missouri River Basin Proj. Transmission Div., Spec. 2442.

Okla., Stillwater—FIELD FACILITIES, etc.—B.A. 5-18. Agricultural & Mechanical College, Stillwater, addn. of 10,000 seats and other facilities at Lewis Field. $125,000. Plans deposit $25. Wright & Selby, Hightower Bldg., Oklahoma City, Zone 2, archts.

Ont., Toronto—SUBWAY—B.A. 5-18. Toronto Transportation Comm., 35 Yonge St., Toronto, Sects. 3 and 5, Yonge Street Subway. Plans deposit $100. Extended date: CD 3-26.

† Oregon—TRANSMISSION LINE—CLEARING RIGHT-OF-WAY. B.A. 5-19. Bonneville Power Adm., Box 3621, Portland. Zone 8. Clearing right-of-way 5.5 mi. from Detroit to Mehama, Marion County. Next Forest, 20.1 mi. Mary, Detroit 24.0 ex transmission line, Inc. 5127, Marion Co. Plans deposit $1.

Tenn., Lewisburg—GAS SYSTEM—B.A. 5-19. Town Hall, natural gas distrib. and transmission main. Plans deposit $25. J. W. Goldsmith Eng. Co., Inc., 726 S. 24th St., Birmingham 3, Ala., engr. CD 7-1-49.

† Illinois—POWER LINE, etc.—B.A. 5-22—U. S. Eng. Room 3, Courthouse & Custom House, 1114 Market St., St. Louis 1. Mo. approx. 1500 lin. ft. 34.5 kv. power line and substation, installing three 250 kva. single phase transformers, etc., to serve East Alton Pump Station of Wood River Drainage & Levee Dist., Proj. Item 14, 12, Madison Co., Inc. Circulars 23-065-50-44. CD 7-23-49.

† Idaho—Boise—ARMY BARGE BERTH—B.A. 5-23. Office of Chief of Constr., 13th Naval Dist., 1611 W. Wheeler St., Seattle, Wash. 16x11 ft. frame shed and barge bldg. addn. at U. S. Naval Reserve Training Center, Spec. 2851.

▲† Pa.—Mechanicsburg—OIL STORAGE—B.A. 5-23. Gen. Supply Office, Naval Supply Depot, Mechanicsburg. storage facilities, NOY 23122. $1,700,000.

Texas—RAILWAY LINE—B.A. 5-23—Gulf, Colorado & Santa Fe Ry. Co., W. T. Dombo, asst. ch. engr., Santa Fe Bldg., Galveston. relocation 12.7 mi. standard gage main railway line between Keppel and Blum, Inc. to Whitney Dam and Reservoir Proj., Brazos and Bosque Counties. Approx. $250,000. Plans deposit $10.

† Washington—DISTRIBUTION LINE—B.A. 5-23—Bureau of Reclamation, Dept. Interior, 202 N. 4 Ave., Yakima. 2.6 ex. distr. line to Mile 61.5 Pumping Plant Main Div., Yakima Proj., about 9 mi. northeast of Prosser. Spec. 11482.

† Virgin Islands—TELEPHONE SYSTEM—B.A. 5-23—Rear Adm. H. Newton, Jr., Dir. Pub. Wks. Construction Div., Community Facilities Service, General Services Admin., General Services Bldg., Washington 25, D. C., or Acting Governor, Virgin Islands, Govt. Bldg., Charlotte Amalie, St. Thomas. Insul. Proj. No. 55-U-113, and St. Croix Insul. Proj. No. 55-U-504. Plans deposit $50, alt. $20. 4-20.

† California—CIRCUIT BREAKERS—B.A. 5-25—Bureau of Reclamation, Room 1016, Federal Office Building, Sacramento 14. Circuit breakers for Delano Substation, Delano, Tulare County, for Delano-Earlimart-Central Valley Proj., Spec. 2442. L. A. Matheson, dir. engr.

LOW BIDDERS

▲ Ill.—Lake Forest—SEWER MAINS, etc.—Lake Forest Sanitary Dist., 660 Deerpath, Lake Forest. 12x2400 ft. vitrified clay sewer, 18x1200 ft. R.C.P. sewer, 2 pumping stations, etc. Ralph L. Smith Co., 1 N. LaSalle St., Chicago. Zone 11. $2,500,000. CD 4-26.

▲ Mass.—Boston—PIER—Port of Boston Auth., Commonwealth Pier No. 5, Boston. Marginal wharf, 1,000 ft. long, 200 ft. wide, with bulkhead, fender system & utilities. Metcalf & Eddy, 247 Cabot St., Newton, Mass. $3,542,268.

▲† Virginia—POWER LINE—CLEARING—B.A. 5-22—Rural Electrification Adm., Washington 25, D. C. 69 mi. single-phase, Rappahannock Electric Coop., Inc., Fredericksburg. Spec. 1-4-3-4-1-50. Bids opened at Fredericksburg. Low bidder: Asplundh Tree Expert Co., 3708 Grant Ave., Philadelphia 14, Pa. $4,157. Fees.

CONTRACTS AWARDED

▲† North Dakota—TRANSMISSION LINES—Bureau of Reclamation, Region 6, Federal Office Building, Billings, Mont. Missouri River Basin Proj., Garrison Div., Power Transmission Facilities, Spec. 2441. Low bidder: Morrison-Knudsen Co., Inc., Boise, Idaho. $1,335,000. Bids 4-20. Alt. 4-22 under LB.

▲† Virginia—SUBSTATION—B.A. 5-17—Rural Electrification Adm., Washington 25, D. C. Substation for Northern Neck Electric Coop., Warsaw. Spec. 1-4-3-4-1-50. Bids opened at Fredericksburg. Low bidder: Asplundh Tree Expert Co., 3708 Grant Ave., Philadelphia 14, Pa. $1,436,004. Fees. CD 4-12, under LB.

▲† Alaska—RADIO TRANSMITTER—The Alaska Communications System, Anchorage. Equipment for new 50 kw. radio transmitter at Anchorage, 10 kw. transmitter at Kodiak, and 1 kw. transmitter at Nome, Alaska. Low bidder: Radio Corporation of America, Camden, N. J. $3,000,000. Bids 4-24.

Proposal Advertisements see pp. 108 to 111

OFFICIAL PROPOSALS

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SEND COPY TO OFFICIAL PROPOSAL DIVISION, ENGINEERING NEWS-RECORD, 330 W. 42ND ST., NEW YORK 18, N. Y.

Bids: June 1 and June 2, 1950 (727)

Sewage Disposal System and Sewer Improvements

City of Tampa, Florida

Proposals are invited by the City of Tampa, Florida for construction of portions of the Sewage Disposal System and Sewer Improvements and will be received in the regular meeting place of the Board of Representatives until the following times:

Intercepting and Trunk Sewers and Force Mains, 10:00 A.M., EST, June 1, 1950; Pumping Stations, 2:00 P.M., EST, June 1, 1950; outfall 10:00 A.M., EST, June 2, 1950; Sewage Treatment Plant, 2:00 P.M., EST, June 2, 1950.

Plans and contract documents may be examined and obtained at the office of the Superintendent of Sewers, Department of Public Works, City Hall, Tampa, Florida and at the offices of Greeley and Hansen, Engineers, 220 South State Street, Chicago, Illinois.

City of Tampa, Florida
By Curtis Hixon, Mayor

Dated May 4, 1950.

Bids: June 5, 1950 (711)

Sewage Treatment Plant

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF FINANCE
DIVISION OF PURCHASES

Sealed bids for constructing Bucklin Point Sewage Treatment Plant in East Providence, Rhode Island will be received at office of State Purchasing Agent, State House, Providence until 10 a.m. Eastern Daylight Saving Time on June 5, 1950 and publicly opened and read at that time.

Project includes construction of seven one- and two-story buildings from 24x26 ft. to 74x128 ft.; six Grit Channels; one Pre-Aeration Tank, 58x212.5 ft.; two Settling Tanks, each 55x250 ft.; two Sludge Digestion Tanks, 55 ft. depth and 75 ft. diameter, respectively; two Sludge Elutriation Tanks, each 20 ft. diameter; sewers, conduits, patrols, and pipelines; equipment; and appurtenant work.

Drawings and contract documents may be seen on or after May 1, 1950 at above office or office of Blackstone Valley Sewer District Commission, State Office Building at Metcalf & Eddy, Engineers, 1300 Statler Building, Boston, Massachusetts weekdays except Saturdays and holidays, 8:30 a.m. to 4:30 p.m. and may be obtained from office of State Purchasing Agent on $100 deposit, all of which will be refunded to unsuccessful bidders upon returning the drawings and documents in good condition, after an award has been made.

Bid Security $125,000 certified check, bid bond, or cash; performance bond 100%.

Prevailing wage rates and Public Work labor laws applicable.

FRANKLYN A. ADAMS
STATE PURCHASING AGENT

Contractors Watch This Section —

for new projects. Publish your announcements through the proposal sections of *Engineering News-Record* and get their bids.

The minute you seal the envelope you seal the verdict...

NO ONE but a bidder can decide, practically, whether he, or someone else, will be the successful bidder on any contract . . . because it is you — the bidder — who decide what you will charge to do the work. No one can decide that but you. So, you actually "write your own ticket."

NATURALLY, you must deliver certain specified materials and perform definite functions, within a certain time—that much of the job is something over which you have no control. But . . . it is when you begin to plan ways and means of DOING the job that you start to win or lose it. If you can do it more quickly, with less loss of motion, and, possibly, with fewer man-hours to charge against the job—in other words, at a lower cost to you — you will have the "edge" you need to make you the successful bidder.

LOW cost operation is usually the result of a thorough knowledge of the most efficient methods—and the use of modern equipment. You will be well repaid through your reading of ENGINEERING NEWS-RECORD—both editorial and advertising.

OFFICIAL PROPOSALS
(Continued from page 108)

Bids: May 23, 1950 (722)

New Jersey Turnpike Authority

Sealed proposals will be received by the New Jersey Turnpike Authority for:

CONTRACT NO. 27

The work to be performed under this contract involves the construction of fifteen (15) reinforced concrete slab bridges, street paving and incidental work in connection with the construction of the New Jersey Turnpike, Section 2 between Woodbury Heights and Hartford in Gloucester, Camden and Burlington Counties, New Jersey.

Principal items of work include:
Excavation and Grading, 1,600,000 Cu. Yds.; Concrete, 14,000 Cu. Yds.; Reinforcement Steel, 1,200,000 Pounds; Structural Steel, 2,000,000 Pounds; Concrete Bearing Piles, 51,000 Lin. Ft.; Metal Bridge Railing, 2,500 Lin. Ft.; Pavement, 42,000 Sq. Yds.; Pipe Drains, 2,500 Lin. Ft.; Pipe Conduit, 12,400 Lin. Ft.

Proposals will be received at the office of the New Jersey Turnpike Authority, 81 Prospect Street, Trenton, New Jersey, until 10:30 o'clock in the morning of May 23, 1950, and thereafter in the Veterans Room of the War Memorial Building, Memorial Drive at Willow Street, Trenton, New Jersey, until 11:00 A.M. on the same date, at which latter time and place all proposals will be publicly opened and read.

The receipt and opening of proposals is subject to proper prequalification of the bidder in accordance with the regulations adopted by the New Jersey Turnpike Authority. Bidders must also submit with their proposal a revised financial statement and a statement of past contracts of similar character, experience and ability to be inspected by prospective bidders during office hours, after May 2, 1950 at the office of the New Jersey Turnpike Authority, 81 Prospect Street, Trenton, New Jersey, and at the office of the Eastern Contracting Company, Cuthbert and Cooper, Incorporated, 100 North Second Street, Harrison, New Jersey, Pennsylvania and Burlington Airport, Burlington, New Jersey.

Contract documents will be furnished for $200 for each set upon application to the Authority. The payment will not be refunded and contract documents are not required to be returned.

Proposals must be made upon the standard proposal forms furnished by the Authority, in accordance with the Standard Specifications for Construction of the New Jersey Turnpike, and must be enclosed in sealed addressed envelopes bearing the name and address of the bidder and the number of the contract on the outside, and accompanied by a certified check payable to the order of the New Jersey Turnpike Authority, or a proper bond, each for not less than ten per cent (10%) of the amount of the proposal but not less than $10,000.00 nor more than $200,000.00 and must be delivered at the above place on or before the hour named. Copies of the proposal form to be used for submitting proposals for the work covered by this contract, and the specifications, general conditions, special provisions, contract, financial statement and guarantee statement to be submitted with proposal, and special addresses of each bridge are included in the sealed form with the contract documents.

The contract will be awarded or proposals will be rejected within forty-five (45) days from the date of opening proposals.

The right is reserved to reject any or all proposals.

NEW JERSEY TURNPIKE AUTHORITY
Paul L. Troast
Chairman

April 25, 1950

Bids: May 25, 1950 (724)

Storage Reservoirs

CONTRACT 124
CONSTRUCTING THE CEDAR SWAMP MOUNTAIN STORAGE RESERVOIRS

SEALED PROPOSALS addressed to The Board of Control and engineer of The Metropolitan District and endorsed "CONTRACT 124, PROPOSAL FOR THE CONSTRUCTION OF THE CEDAR SWAMP MOUNTAIN STORAGE RESERVOIRS IN THE CITY OF HARTFORD, CONNECTICUT," will be received at the Executive Office of The Metropolitan District, 125 Broad Street, Hartford, Connecticut, until 2:15 P.M. Eastern Standard Time (2:15 P.M. Eastern Daylight Saving Time), Thursday, May 25, 1950, at which time and place they will be publicly opened and read.

The work to be done consists of the construction of two covered reservoirs, separated by a divider wall, on Metropolitan District property in the southwest section of Hartford, each 125 feet to 161 feet and 22 feet deep, to contain gunite capacity each of reinforced concrete flat-slab roof construction, with the necessary pipe lines, drainage structures, telephone duct, and gate chamber. The principal materials except concrete, furnished by the District.

Approximate quantities for the principal items:

Earth, rehill and embankment, 32,000 cubic yards; Concrete masonry, complete, 3,000 cu. yds.; Reinforcing steel, 150 tons; Plain and ornamental iron and steel work, 25 tons; Gunite mortar, complete, 1,000 cu. yds.

Plans and specifications may be obtained on and after May 11, 1950 at the office of the Deputy Manager and Chief Engineer of The Water Bureau of The Metropolitan District, 2 American Row, Hartford, Connecticut, on deposit of $25, which amount will be returned or certified or cashier's check made payable to The Water Bureau of The Metropolitan District, which amount will be returned in full to a bidder who submits a bona fide proposal and does not withdraw it before the award of contract, or to any bidder who submits a bid and who requests the return of his deposit after the opening of bids. No deposit will be refunded after that time. Specifications used in making a bid will be considered as returned.

Each proposal must be accompanied by a certified check for an amount equaling not less than ten per cent (10%) of the total amount bid, made payable to The Metropolitan District, which amount will be forfeited to the District as stated in the Information for Bidders, if the contract is not awarded to the bidder, or if awarded, he fails to enter into the contract and give satisfactory performance of the contract.

BOARD OF CONTROL AND SUPERVISION
By Richard Dewing, Clerk
Hartford, Connecticut
May 1, 1950

Bids: May 15, 1950 (724)

Furnishing and Delivering Compound Water Meters

WASHINGTON SUBURBAN SANITARY COMMISSION
CONTRACT NO. 227-W

Sealed proposals for furnishing and delivering fifteen (15) compound water meters will be received at the office of the Washington Suburban Sanitary Commission, Hallowell Street, Hyattsville, Maryland, until 10:00 A.M. Eastern Daylight Saving Time, Monday, May 15, 1950, at which time and place they will be publicly opened and read.

Specifications may be obtained from W. B. Dearing, Purchasing Agent of the Commission, Hyattsville, Maryland.

Bids: May 24, 1950 (724)

State Road Work

Sealed proposals will be received by the State Highway Department at 2:00 P.M. E.S.T., Tuesday, August 2, or P.M. E.D.S.T., 2:00 P.M. E.S.T., May 24, 1950, and at that time and place opened for furnishing the materials and performing the work required for:

CONTRACT 816
Federal Aid Project S 59 (2)
BLACKISTON TO CLAYTON
Kent County
C. C. Widening & Hot Mix Asphalt Surface

[illegible]

OFFICIAL PROPOSALS

[illegible]
U. S. F. Cement Concrete Sidewalk
Each Catch Basins
2,500 Lbs. Castings
40,000 S. Y. Sodding
100 L. F. Ditching
240 T. Sand

CONTRACT 1020
Federal Aid Project F-186 (2)
FARNHURST INTERCHANGE
New Castle County
Concrete & Steel Grade Separation Structures And Approach Roadways
2.111 Miles

L. S. Clearing
L. S. Grubbing
165,000 C. Y. Excavation
4,950 C. Y. Structure Excavation
500 C. Y. Borrow for Stripping
30,000 C. Y. Selected Borrow
12,600 C. Y. Cement Concrete Pavement
[illegible] C. Y. Conc. Bridge Approach Slabs
[illegible] L. F. Bored Expansion Joint
[illegible] C. Y. C. P. Masonry Underpass
[illegible] C. Y. C. P. Monastic Footing
[illegible] C. Y. C. P. Masonry
[illegible] C. Y. C. P. Masonry Piers
1,200 C. Y. C. P. Masonry Abutments
220 C. Y. C. P. Masonry Deck
350 S. Y. Waterproofing
387,000 Lb. Reinforcing Steel
Sq. Yd. Mesh Reinforcement
[illegible] Lin. Ft. Sheet Piling
42 L. F. 12" B. C. Pile
154 L. F. 12" B. C. Pile
1,540 L. F. 12" B. C. Pile
[illegible] L. F. 12" B. C. Pile
162 L. F. 8" C. I. C. P. Pile
[illegible] L. F. 24" C. M. Pipe
[illegible] L. F. 24" C. C. P. Pipe
[illegible] L. F. 18" C. C. P. Pipe
[illegible] L. F. 12" C. C. P. Pipe
[illegible] L. F. Conc. Curb
4,200 S. F. Conc. Sidewalk
[illegible] L. F. Wood Shoulder Curb
2 Each Catch Basin (Type B)
1 Each Catch Basin (Type C)
1 Each Manhole (Type S)
[illegible] Each Manhole (Type S)
2,000 L. F. Guard Fence
2,250 L. F. Wire Type Guard Fence
[illegible] Each End Post Assemblies
[illegible] S. Y. Topsoil
[illegible] S. Y. Topsoiling
[illegible] A. Seeding
24,000 S. Y. Sodding
[illegible] Gal. Bit. Asphalt
12,250 Gal. Bit. Asphalt
[illegible] Ton Asphalt
[illegible] Ton Chips
[illegible] Crushed Chips
[illegible] S. Y. Removal Exist. Conc. Pavement
L. S. Obliterating Abandoned Roads
1,470 L. F. Line Painting (Double)
[illegible] L. F. Line Painting (Broken)
L. S. Lighting Controls (Bridges)
L. S. Lighting Underpass
1,575 S. Y. Mortared Rip Rap

Contracts 816 and 1020 are Federal Aid Projects and will be governed by the provisions of the Federal Aid Highway Act, as amended.

The Department Agents for these Contracts shall be the Delaware State Employment Service with office located at 631 Orange Street, Wilmington, Delaware.

Attention is called to the Special Provisions for the proposed specifications and contract agreement.

Performance of contract shall commence within ten (10) days after execution of the contract and be completed on or before each specified date.

Monthly payments will be made for ninety (90) per cent of the estimated work completed each month.

Bidders must submit proposals upon forms provided by the Department.

Each proposal must be accompanied by a surety bond, certified check or cash in the amount of at least ten (10) per centum of the total amount of the proposal.

The envelope containing the proposal must be marked: Proposal for the construction of State Highway Contract No. [illegible]

The right is reserved to reject any or all bids.

The contract will be awarded or rejected within thirty (30) days from the date of opening proposals.

Complete sets of plans and specifications may be obtained at the Main Office upon receipt of a deposit of $5.00 for each Contract, which amount will not be refunded.

Make checks payable to the State Highway Department.

STATE HIGHWAY DEPARTMENT
[illegible] Harden, Jr., Chairman
M. Allen Wilson, Chief Engineer
Dover, Delaware
April 28, 1950

(Continued on page 110)

OFFICIAL PROPOSALS
(Continued from page 109)

Bids: May 25, 1950 (7331)

THE PORT OF NEW YORK AUTHORITY
PORT NEWARK
REPAVING CHANNEL STREET
CONTRACT EN-51

Sealed proposals for the repaving of Channel Street at Port Newark will be received in the office of the Chief Engineer of The Port of New York Authority, Room 1306, 111 8th Ave., New York 11, N. Y., until 2:30 P. M. Thursday, May 25, 1950, and thereafter in the Auditorium of the Authority at the same address until 2:30 P. M. on the same date, at which latter time and place said proposals will be publicly opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $25.00 per set. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman,
Chairman.

New York, May 11, 1950.

Bids: May 25, 1950 (7311)

Construction of Route Extension

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for

RT. 29 EXT., SECTION L PERRY STREET RAMP

Construction of Route 29, Ext., Section L Perry Street Ramp Underpass at Pennsylvania Railroad (South Trenton Branch), Station 5+50 in the City of Trenton, Mercer County, Federal Project No. UI-029(3). The principal items of construction are

Estimated:
- 620,420 lbs. Structural Steel
- 84,500 lbs. Reinforcement Steel in Structures
- 2,319 cu. yds. Concrete in Structures
- Lump Sum, Switching Station

Bids for the above will be received at the office of the State Highway Department, Room 102, State House Annex, Trenton, N. J., on Thursday, May 25, 1950, at the o'clock A.M. EASTERN STANDARD TIME), (11:00 A.M. DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the pre-qualification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTICE. The proposed project is a Federal Aid Project authorized by the provisions of Title 23 of the Revised Statutes of New Jersey and supplements and by Section 1 Public Law 541, 81st Congress, and is to be constructed in accordance with the special provisions and requirements of the Federal Bureau of Public Roads Department of Commerce, referred to in the specifications, which may require that labor be employed from lists furnished by the State Employment Service at 15 North Wilson Street, Trenton, N. J. The attention of bidders is directed to the requirements of the Federal Act as to the minimum wages to be paid mechanics and laborers employed on the work, which wages have been established by the Secretary of Labor and are to be set forth in the contract and bond to be executed by the successful bidder.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be examined or procured by bidder during office hours. It will be furnished on a deposit basis of $5.00 per set, which will be refunded upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 102, State House Annex, Trenton, N. J. Bidders must be prepared to submit the standard proposal forms and special addressed envelopes furnished by the State Highway Department, and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certificate check shall not be less than $2,000.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not submitted in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: Spencer Miller, Jr.
State Highway Commissioner

Bids: May 25, 1950 (7330)

Reconstruction of Bridge & Approaches

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for

ROUTE 28, SECTIONS 8A & 5B

Reconstruction of Middlebrook Bridge and Approaches on Route 28, Sections 8A and 5B, in Bridgewater Township and Borough of Bound Brook, Somerset County. Length 0.235 mile.

Estimated: Roadway Items
- 2,500 cu. yds. Roadway Excavation—Earth
- 1,600 sq. yds. Pavement Excavation
- 3,400 cu. yds. Borrow Excavation
- 2,600 cu. yds. Channel Excavation
- 145 tons Pavement, Type MA-B5
- 1,040 sq. yds. 8" Pen. Mac. Inter. Course
- 4" Mac. base

Bridge Items
- 924 cu. yds. Concrete in Structures
- 142,600 lbs. Structural Steel
- 41,300 lbs. Reinforcement Steel

Bids for the above will be received at the office of the State Highway Department, Room 102, State House Annex, Trenton, New Jersey, on Thursday, May 25, 1950, at ten o'clock A.M. EASTERN STANDARD TIME), eleven o'clock (11:00 A.M. DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the pre-qualification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be examined or procured by bidder during office hours. It will be furnished on a deposit basis of $5.00 per set, which will be refunded upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 102, State House Annex, Trenton, N. J. Bidders must be prepared to submit the standard proposal forms and special addressed envelopes furnished by the State Highway Department, and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $2,000.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not submitted in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: Spencer Miller, Jr.
State Highway Commissioner

Bids: May 25, 1950 (7329)

Reconstruction of Bridge & Approaches

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for

ROUTE 28, SECTIONS 8A & 5B

Reconstruction of Middlebrook Bridge and Approaches on Route 28, Sections 8A and 5B, in Bridgewater Township and Borough of Bound Brook, Somerset County. Length 0.235 mile.

Estimated: Roadway Items
- 2,500 cu. yds. Roadway Excavation—Earth
- 1,600 sq. yds. Pavement Excavation
- 3,400 cu. yds. Borrow Excavation
- 2,600 cu. yds. Channel Excavation
- 145 tons Pavement, Type MA-B5
- 1,040 sq. yds. 8" Pen. Mac. Inter. Course
- 4" Mac. base

Bridge Items
- 924 cu. yds. Concrete in Structures
- 142,600 lbs. Structural Steel
- 41,300 lbs. Reinforcement Steel

Bids for the above will be received at the office of the State Highway Department, Room 102, State House Annex, Trenton, New Jersey, on Thursday, May 25, 1950, at ten o'clock A.M. EASTERN STANDARD TIME), eleven o'clock (11:00 A.M. DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the pre-qualification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be examined or procured by bidder during office hours. It will be furnished on a deposit basis of $5.00 per set, which will be refunded upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 102, State House Annex, Trenton, N. J. Bidders must be prepared to submit the standard proposal forms and special addressed envelopes furnished by the State Highway Department, and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $2,000.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not submitted in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: Spencer Miller, Jr.
State Highway Commissioner

Bids: May 25, 1950 (7328)

Reconstruction of Bridge & Approaches

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

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- 3,400 cu. yds. Borrow Excavation
- 2,600 cu. yds. Channel Excavation
- 145 tons Pavement, Type MA-B5
- 1,040 sq. yds. 8" Pen. Mac. Inter. Course
- 4" Mac. base

Bridge Items
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- 41,300 lbs. Reinforcement Steel

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Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be examined or procured by bidder during office hours. It will be furnished on a deposit basis of $5.00 per set, which will be refunded upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 102, State House Annex, Trenton, N. J. Bidders must be prepared to submit the standard proposal forms and special addressed envelopes furnished by the State Highway Department, and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $2,000.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not submitted in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: Spencer Miller, Jr.
State Highway Commissioner

Bids: May 25, 1950 (7327)

Construction of Route Extension

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for

RT. 29 EXT., SECTION L PERRY STREET RAMP

Construction of Route 29, Ext., Section L Perry Street Ramp Underpass at Pennsylvania Railroad (South Trenton Branch), Station 5+50 in the City of Trenton, Mercer County, Federal Project No. UI-029(3). The principal items of construction are

Estimated:
- 620,420 lbs. Structural Steel
- 84,500 lbs. Reinforcement Steel in Structures
- 2,319 cu. yds. Concrete in Structures
- Lump Sum, Switching Station

Bids for the above will be received at the office of the State Highway Department, Room 102, State House Annex, Trenton, N. J., on Thursday, May 25, 1950, at ten o'clock A.M. EASTERN STANDARD TIME), eleven o'clock (11:00 A.M. DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the pre-qualification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTICE. The proposed project is a Federal Aid Project authorized by the provisions of Title 23 of the Revised Statutes of New Jersey and supplements and by Section 1 Public Law 541, 81st Congress, and is to be constructed in accordance with the special provisions and requirements of the Federal Bureau of Public Roads Department of Commerce, referred to in the specifications, which may require that labor be employed from lists furnished by the State Employment Service at 15 North Wilson Street, Trenton, N. J. The attention of bidders is directed to the requirements of the Federal Act as to the minimum wages to be paid mechanics and laborers employed on the work, which wages have been established by the Secretary of Labor and are to be set forth in the contract and bond to be executed by the successful bidder.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be examined or procured by bidder during office hours. It will be furnished on a deposit basis of $5.00 per set, which will be refunded upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 102, State House Annex, Trenton, N. J. Bidders must be prepared to submit the standard proposal forms and special addressed envelopes furnished by the State Highway Department, and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $2,000.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not submitted in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: Spencer Miller, Jr.
State Highway Commissioner

OFFICIAL PROPOSALS

Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 102, State House Annex, Trenton, N. J. Bids must be made upon the standard proposal forms in the possession of bidders, designated in the standard State Highway specifications, and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certificate check shall not be less than $2000.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not submitted in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: Spencer Miller, Jr.
State Highway Commissioner

OFFICIAL PROPOSALS

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specification No. 7503) will be received by Bureau of Reclamation, Custom House, Washington, May 25, 1950, and then publicly opened for furnishing labor and certain materials and performing all work for the installation of aluminum crest railing with lighting fixtures on Grand Coulee Dam, Columbia Basin Project, Washington. The work is situated at Coulee Dam, located about 90 miles northeast of Othello, Washington. Principal items are approximately: remove temporary railing and electrical materials; install aluminum crest railing with lighting, concrete in curbs, and other work. Time allowed for completion will be 180 days. For particulars address Bureau of Reclamation, Coulee Dam, Washington, or Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(7284)

(Continued on page 111)

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OFFICIAL PROPOSALS

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Bids: May 23, 1950 (725)

PENNSYLVANIA TURNPIKE COMMISSION

Harrisburg, Pennsylvania

NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission, through the Secretary, North Fourth Street, Harrisburg, Pennsylvania, until 10:00 A.M. (Eastern Daylight Saving Time) the 23rd day of May 1950, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania, and publicly opened and read aloud for the following contract and/or contracts:

For the construction of structures and the grading, drainage and paving of Turnpike Section 56, part of the Western Pennsylvania Turnpike Extension in Hampton, West Deer and Indiana Townships, Allegheny County, Commonwealth of Pennsylvania. The section being extended as follows:

Beginning at a point approximately 1,000 feet East of the Centerline of Township Road 565 in Hampton Township at Turnpike Station 1965+00, Allegheny County, thence in an easterly direction 25,700 feet to a point approximately 1,000 feet East of Township Road 565 in Indiana Township at Turnpike Station 2700+00, Allegheny County, containing approximately 4.9 miles.

The approximate quantities of the principal items are as follows:

Class 1 Excavation, 1,102,800 cu. yds.; Class 2 Excavation, 20,000 cu. yds.; Reinforced Concrete Concrete Pavement, 116,000 sq. yds.; Class A Concrete, 700 cu. yds.; Class B Concrete, 6,000 cu. yds.; Structural Steel, 1,200 pounds; Reinforcing Bars, 220,000 pounds; Miscellaneous Structural Steel, 45,000 pounds.

For the construction of structures and the grading, drainage and paving of Turnpike Section 58, part of the Western Pennsylvania Turnpike Extension in Indiana Township, Allegheny County, Commonwealth of Pennsylvania. This section being extended as follows:

Beginning at a point approximately 150 feet East of the Turnpike Station 2700+00 at Turnpike Station 2700+00, Allegheny County, thence in an easterly direction 25,250 feet to a point approximately 100 feet East of Township Road 565 in Indiana Township at Turnpike Station 2957+50, Allegheny County, containing approximately 4.8 miles.

The approximate quantities of the principal items are as follows:

Class 1 Excavation, 1,175,000 cu. yds.; Class 2 Excavation, 21,500 cu. yds.; Borrow Excavation, 14,000 cu. yds.; Reinforced Concrete Concrete Pavement, 113,000 sq. yds.; Class A Concrete, 1,000 cu. yds.; Class B Concrete, 6,000 cu. yds.; Reinforcing Bars, 1,250,000 pounds; Miscellaneous Structural Steel, 75,000 pounds.

Copies of plans, specifications and other contract documents, including proposal forms, may be seen and open to public inspection at the office of the Pennsylvania Turnpike Commission, located at Harrisburg, Pennsylvania, on May 8, 1950. Copies of specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Commission for the sum of five (5) dollars per copy. Copies of the contract documents may be purchased from the Pennsylvania Turnpike Commission for the sum of fifty (50) cents per set, for each section.

Plans and contract documents (except those of a voluminous nature) may be obtained from the Commission upon deposit of ten (10.00) dollars for each set, such deposits to be refunded in full to any actual bidder upon return of such documents in good condition within ten (10) days after the date of the opening of the bids. Refund will be made for all parts of contract documents and specifications upon award of the project, withdrawing from letting to the Pennsylvania Turnpike Commission. Remittances are payable to the Pennsylvania Turnpike Commission and must accompany requests for drawings, specifications, contract documents, and cross sections.

The Pennsylvania Turnpike Commission reserves the right to award each section as a separate contract or in a combined contract.

The character and amount of bid securities to be furnished by bidder is stated in the Instructions to Bidders.

No bids may be withdrawn for thirty consecutive after the scheduled closing time for receipt of bids.

PENNSYLVANIA TURNPIKE COMMISSION

James E. Torrance
Secretary and Treasurer

Harrisburg, Pennsylvania
April 28, 1950

Bids: June 6, 1950 (724)

Sewage Treatment Work

THE ALTOONA CITY AUTHORITY
ALTOONA, PENNSYLVANIA

Sealed bids for the construction of the Easterly Sewage Treatment Works in the City of Altoona, Blair County, Pennsylvania, will be received by the Altoona City Authority in the City Hall, Altoona, Blair County, Pennsylvania, until 11 A.M. (D.S.T.), June 6, 1950, and then publicly opened and read aloud.

The work will be divided into five contracts designated as follows:

CONTRACT NO. 1—STRUCTURAL WORK
CONTRACT NO. 2—MECHANICAL WORK
CONTRACT NO. 3—ELECTRICAL WORK
CONTRACT NO. 4—HEATING & VENTILATING WORK
CONTRACT NO. 5—PLUMBING WORK

The work may be awarded to one contractor for contracts No. 1 and 2 or combined.

Information for Bidder, Form of Bid, Specifications and Form of Contract may be examined at the office of the City Engineer, City Hall, Altoona, Pennsylvania, or at the office of Albert K. Mitchell, Consulting Engineers, 121 South Broad Street, Philadelphia 7, Pennsylvania, and may be obtained from the latter office upon deposit of $40.00 for each set of specifications. Deposit will be refunded in full upon return of specifications in good condition within five days after the opening of bids. One half amount of the deposit for one set will be refunded to each unsuccessful bidder and deposits will be refunded with a deduction of $5.00 to defray the actual cost of reproduction of the documents returned. Bidders who do not return the documents within the time stated the entire amount of deposit will be forfeited.

A certified check or bid bond drawn to the order of the Altoona City Authority equal to five per cent of the amount of bid must be submitted with the proposal.

The proposal must be sealed and marked "BID TO PROPOSAL FOR CONSTRUCTION OF THE EASTERLY SEWAGE TREATMENT WORKS" addressed to MR. J. H. DILLEN, SECRETARY OF ALTOONA CITY AUTHORITY ALTOONA PENNSYLVANIA and the contract or contract under which the proposal is to be submitted must also be clearly marked.

The Altoona City Authority reserves the right to reject any or all bids or waive any informality and to award each contract to cover the construction of the Easterly Sewage Treatment Plant as may be deemed to be for the best interest of the Altoona City Authority.

No bidder may withdraw his bid within sixty (60) days after the actual date of the opening thereof.

J. H. DILLEN, Secretary
ALTOONA CITY AUTHORITY

May 2, 1950

U. S. Government

office of the District Engineer, Corps of Engineers, U. S. Army, 1217 U. S. Post Office and Custom House, St. Paul 1, Minnesota, received bids for furnishing all work required for Construction of Lower Lock and Dam 2, Mississippi River, Minneapolis, Minnesota, will be received in this office until 11:00 A.M., C.S.T., 24 May 1950 and then publicly opened. Further information upon application. (691)

OFFICIAL PROPOSALS

Bids: May 31, 1950 (699)

Sewage Treatment Plant, Intercepting and Outlet Sewers

THE LINDEN ROSELLE SEWERAGE AUTHORITY
LINDEN, N. J.

1. Sealed proposals for the construction of the herein described contracts of a pollution abatement project in the City of Linden, New Jersey, will be received by the Linden Roselle Sewerage Authority in the Council Chambers, City Hall, Linden, at 11:30 P.M. on Wednesday, May 31, 1950, and then publicly opened and read immediately thereafter.

2. The work will consist of providing all labor, materials, equipment and incidentals required for the construction of the following:

Contract I—Intercepting and Outfall Sewer (Approx. 1400 L.F. of 30-inch R.C. Pipe, 1900 L.F. of 42-inch R.C. Pipe, 3800 L.F. of 48-inch R.C. Pipe and appurtenant structures). *Contract II—Plant Outfall Force Main* (Approx. 3500 L.F. of concrete flume, 2800 L.F. timber piling, 3500 L.F. 24-inch R.C. Pipe, and appurtenant structures). *Contract V—Sewage Treatment Plant General Construction* (Primary treatment works including pumping station and including approx. 200 cu. yds. of concrete, 1,000 cu. yds. of earth excavation, 1,000 L.F. of 12-inch pipe and fittings, 1500 L.F. timber piling, 2 valves, 2 sluice gates, mechanical equipment and appurtenances). *Contract VI—Sewage Treatment Plant Superstructures* (450 brick and concrete buildings, approximate cubic contents 100,000 cu. ft.). *Contract VII—Sewage Treatment Plant Electrical Work* (Complete electrical installation for plant buildings). *Contract VIII—Heating and Ventilating Work for Plant Buildings*. *Contract IX—Plumbing Work for plant buildings*. *Contract X—Electrical Work for sewage treatment plant*.

Plans, specifications, bidding and contract documents may be examined at the office of the Consulting Engineers, Alvord, Burdick & Howson, 20 Church Street, New York 7, N.Y. and may be obtained upon the following conditions, to wit:

Contract I—Intercepting and outfall Sewers, Contract II—Plant Outfall and Force Main, Contract V—Sewage Treatment Plant General Construction, Contract VI—Sewage Treatment Plant Superstructures, Contract VII—Sewage Treatment Plant Electrical Work, Contract VIII—Heating & Ventilating Work, Contract IX—Sewage Treatment Plant Plumbing Work, Contract X—Sewage Treatment Plant Electrical Work

Full detail will be made to actual bidders for return of one (1) set in good condition, within ten days after the opening of bids, and receipt of bids; return of all other sets in good condition, within the same period will be refunded 100% of the deposit. Plan deposit checks should be made payable to order of Alexander Potter Associates.

1. All proposals must be on the form furnished by the Authority.

All bids must be accompanied by a certified check or acceptable bidders' bond in the amount of ten (10%) per cent of the amount of the bid made payable to the Linden Roselle Sewerage Authority. Said checks or bonds will be returned to the unsuccessful bidders not later than sixty days after the opening of bids. Checks or bonds of successful bidders will be retained until the completion of the contract.

4. The successful bidder or bidders on each of the several contracts will be required to furnish a Performance Bond conditioned upon the faithful performance of the Contract and upon the payment of all persons supplying labor and furnishing materials in connection with the contract.

7. No bidder may withdraw his bid within sixty (60) days after the date fixed for receipt of bids.

8. The Authority reserves the right to reject any or all bids and to waive any informality in the bid.

BY ORDER OF THE ACTING SECRETARY OF THE LINDEN ROSELLE SEWERAGE AUTHORITY
Charles H. Gross

DATED: April 27, 1950

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P-6413, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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P-6520, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

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P-6499, Engineering News-Record
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P-6166, Engineering News-Record
330 W. 42nd Street, New York 18, N. Y.

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P-6510, Engineering News-Record
68 Post St., San Francisco 4, Calif.

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P-6318, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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P-6411, Engineering News-Record
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(Continued on the opposite page)

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Lorain 77 diesel powered 1½ yd shovel and crane, Caterpillar D13000 engine.

Marion 1-yd diesel powered heavy duty truck crane on heavily reinforced Mack.

P&H Model 100 ⅜-yd. shovel.

SHOVEL & CRANE ATTACHMENTS

Chain crowd L-41 shovel attachment.
P&H 203 shovel attachment.
Chain crowd Lorain 30A shovel attachment.
Lorain 40 Hi-Lift shovel attachment.
Bucyrus Erie 30B tunnel front attachment.
Koehring 301 dragline fairlead.

Backhoe Buckets & Attachments

¾ yd Lorain, 40, LBS ±6105, 44" cutting width, teeth, sheave.
27" outside width drop bottom type LBS ±1033, good condition.
26" outside width solid bottom type LBS ±4377, good condition.
¾ yd Amsco 40" cutting width, LBS ±8101.
Lorain 30 hoe attachment.

NEW TAGLINES

McCaffrey Model 648 for 1¼ to 2 yd crane.
McCaffrey Model 636 for ¾ yd to 1 yd crane.

SHOVEL DIPPERS

Lorain 41, ¾ yd, LBS ±7433, new condition.
New Lima 1 yd, Amsco, LBS ±2295.
Bucyrus Erie 1¼ yd gas air, LBS ±3782, fair.
Lorain 75 manganese 1¼ yd, LBS ±7232, teeth and bail.
Lorain 75B, 1¼ yd extended lip, 1¼ yd LBS ±2260.
Pettibone Mulliken 2 yd Lorain 82 or 820, manganese, LBS ±5361.
Pettibone Mulliken 2 yd for 3500 Manitowac LBS ±5763.

CLAM—DRAG—SCRAPER BUCKETS

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Worthington two-stage, water-cooled, vertical 250±, 60 CFM, new condition.
Ingersoll Rand 105 cubic foot, Waukesha gasoline power, on two rubber tires.
Gardner-Denver 105 cubic foot with air receiver, hose reel, driven by power take-off and mounted on 1941 Ford.
Gardner-Denver air-cooled 105 cubic foot with air receiver, V-belt drive from power take-off and mounted on 1942 Ford chassis with Wood two-yard dump body.
LeRoi 2-stage 105 cubic foot air-cooled, skid mounted, built-in tool boxes, hose reels and hose.
Gardner-Denver two-stage 160 cubic foot skid mounted.
Schramm 210 cubic foot with International UD14 diesel.
Worthington 210 cubic foot, two-stage, air-cooled, on steel wheels with Hercules diesel.
Chicago Pneumatic 210 cubic foot, two-stage, air-cooled, Caterpillar diesel on four rubber tired wheels.
Gardner-Denver 315 cubic foot two-stage, skid mounted, Murphy four-cylinder diesel.
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Cedarapids BBB 1036 Scalper.
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10 x 36 Cedarapids, practically new.
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New and rebuilt Murphy diesels.
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Jaeger 3-yd hi-discharge truck mixer.

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Heltzel 10'-12' finisher, rebuilt.
Blaw-Knox gas-electric 10½'-12½', rebuilt.
2 Koehring 10'-12', rebuilt.

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830'—Truscon 7"x8" forms, with stakes.
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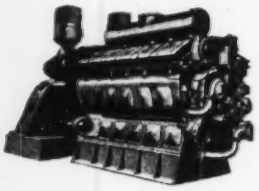

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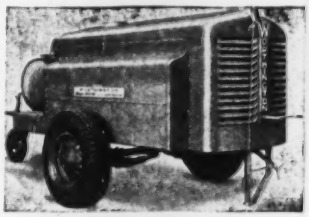

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16"	4	1/8"	1/32"	28 Oz
18"	4	1/8"	1/32"	28 Oz
20"	4	1/8"	1/32"	28 Oz
20"	5	1/8"	1/32"	28 Oz
24"	4	1/8"	1/32"	28 Oz
24"	5	1/8"	1/32"	28 Oz
26"	5	1/8"	1/32"	28 Oz
30"	4	1/8"	1/16"	32 Oz
30"	5	1/8"	1/16"	32 Oz
30"	6	1/8"	1/16"	32 Oz
36"	6	1/8"	1/16"	32 Oz
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POWER plant, Onan 5 KW, 120-240 volt, [illegible]

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Almost new Towermobile, new November, 1948, used three weeks—Priced under cost $4,500.00

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5' 0" x 16' 0"

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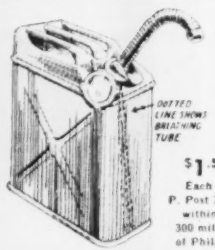

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$69.00 net ton
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Allis Chalmers Model AD Tandem tires, fully equipped, diesel.

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Both in excellent condition and attractive price.

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163 Pcs. SP6a 14 to 17 feet
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Heavy duty smooth bore, wire inserted Suction Hose. Flexible and strong. For use in mines, sewers, trenches, etc. with diaphragm pumps, pressure pumps and other contractors equipment. Prices shown include I.P.T. Couplings attached to each length.

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1½"x20 ft	$4.25	2½"x20 ft	$10.00
2"x20 ft	5.75	3"x20 ft	29.50
2½"x20 ft	6.00	4"x20 ft	38.50
3"x20 ft	6.00	5"x20 ft	50.00
3½"x20 ft	8.00	6"x20 ft	55.75
4"x20 ft	8.50	8"x20 ft	65.00
5"x20 ft	16.75	10"x20 ft	$7.50
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Cotton jacket, rubber lined hose suitable for water supply and discharge service. Constructed exactly like Fire Department hose. Light in weight. For pressures to 200 lbs. Attached to each length are Iron Pipe Thread Couplings.

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	25 Ft.	50 Ft.	100 Ft.
1"	$6.00	$8.00	$15.00
1½"	11.00	14.00	24.00
2"	12.50	15.00	30.00
4"	16.00	20.00	36.00

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Stock No. CO-99

2" x 4 PLY DUCK AND CORD CONSTRUCTION SUITABLE FOR 400 LBS. WORKING PRESSURE

For that difficult job where high pressures are encountered Carlyle offers this rugged, flexible hose saving you over 50% in cost and giving dependable service for the following jobs:

Jetting—Water, Air, Cement
Hydraulic Grout
Steam to 100 lbs. Pressure
Oil Discharge

Low Priced at 25¢ ft

Available in 10-15-20-25-30-50 ft. lengths. High Pressure Couplings attached as follows:

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Male & Male	2½" I.P.T.	$10.00
Female & Male	2½" I.P.T.	12.00
Female & Female	2½" I.P.T.	16.00

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250 Lbs. Working Pressure. Heavy duty extremely flexible Pneumatic Air Hose for all Air Tools, Compressors, Diggers, Riveters, Drills and Breakers. Each length complete with Universal Air Hose Couplings attached. These couplings are quick snap and interchangeable with Air King, Chicago, Cleveland and others.

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½"x50 ft	$ 7.25
¾"x50 ft	13.00
1"x50 ft	8.75
1½"x50 ft	16.00
2"x50 ft	18.50
2½"x50 ft	19.50

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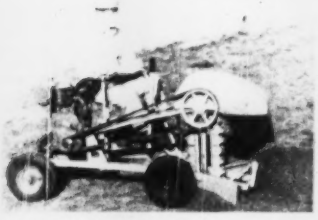
NEW PRODUCTS

Attachment Converts Standard Unit to Elevating Grader

Donor attachment quickly converts standard Caterpillar grader into a one-man self-propelled elevating grader. In making conversion, the standard blade, circle, and drawbar are removed and the elevating carrier adjustably supported under the main frame. A 30-in. disk plow is drawn by plow beam attached to standard drawbar connection. The 42-in. carrier is driven by a power take-off and has a normal speed of 400 fpm. It is equipped with a 4-ply corrugated-top conveyor belt. An auger-type pan cleaner is gear driven. The standard carrier is 19 ft in length. For casting work, a 3-ft. section can be removed. Carrier lift is operated by cables powered by regular blade controls. Upper end of carrier is lifted by the right-hand blade control, while the lower end is connected to the blade side-shift control.—Ulrich Products Corp., Roanoke, Ill.

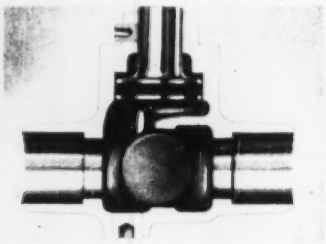


Midget-Size Trencher

Light-duty trencher digs a 4-in.-wide ditch to a maximum depth of 30 in. By making multiple cuts, the Ditch Witch can prepare trenches of any width for large-diameter pipes. Digging mechanism is hydraulically raised and lowered. Spoil is deposited on either side of trench by the spoil chute. An adjustable scraper follows digger to provide a clean-cut ditch. It has a hand-tool ratchet type digger.—Charles Machine Works, Perry, Okla.

Pick-Up to Dump-Truck Kit

Conversion unit for changing stake and pick-up into dump trucks consists of pioUPic hydraulic hoist conversion kit, the Converto-Constructor dump body, patented slip-in portable dump body, and the vertical hydraulic hoist. As no power take-off is required, unit can be operated manually from any location on the truck, or driven electrically from a cab-controlled Blackhawk pump. Lifting capacity of the pioUPic is 6,000 lb.—Converto Mfg. Co., Cambridge City, Ind.



Bronze Balancing Valve

Positive leak-tight shutoff and adjustable flow in a single valve are features of the Equatemp bronze balancing valve for hot-water radiant heating systems. Closing and balancing actions are accomplished by a butterfly-type disk fitted with a composition rubber O-ring. The valve is designed to accommodate any of several standard venting attachments. A well drilled into the stem provides a handy method for taking temperature readings.—Ohio Brass Co., Mansfield, Ohio.

Highway Patrol Pull Grader

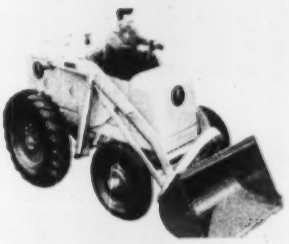
Small pull grader has an 8-ft blade, a wide range of adjustments, and is constructed for rugged use. The No. 4 Hi-Way Patrol has an adjustable rear axle and tractor pole, and may be pulled by track or wheel-type tractor, truck, or team of horses. Flat-spoke or rubber-tired wheels are optional. Information may be obtained from dealers of the Caterpillar Tractor Co., or —Prco, Inc., 6300 E. Stanton Ave., Los Angeles 22, Calif.

Sectional Scaffolding

Basic unit employed in Bobst scaffolding is a sectional ladder with spaced ladder rungs designed as load-bearing members. Rungs are spaced 14 in. apart and the ladder sections are made 12 in. wide and 5 ft 10 in. high. Welded pilot plugs are used at the top of each sectional ladder so that each section is superimposed one upon the other and all are anchored together in true alignment. Ladders are cross-braced rigidly. Putlog trusses connect the ladders together transversely and these can be assembled for any type of service. The Bobst ladder-type scaffolding can also be used for shoring.—W.E.M. Mfg. Co., Ripon, Wis.

Admix Meter for Pavers

Metering device automatically measures a predetermined quantity of liquid air-entraining agent into concrete batch. It is designed for use on Kochring 16-E or 34-E Two-batch Pavers, and is also suitable for use in connection with water batchers in ready-mix or central-mix plants. Entirely mechanical, movement of the paver skip actuates the meter.—Koehring Co., 3026 W. Concordia Ave., Milwaukee 16, Wis.



Half-Yard Tractor Shovel

Payloader tractor shovel is now available in a ½-yd size. The HE features full-reversing transmission, hydraulic brakes, full dumping clearance of 91 in., and hydraulic dumping. It can be used to dig, load trucks, grade, level, backfill, spread, and transport all types of materials.—The Frank G. Hough Co., 852 Sunnyside Ave., Libertyville, Ill.

Air Line Filter

Filter provides clean air essential to peak performance of air-powered tools.

(Continued on page 124)

ANNOUNCING THE

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AN ALL-PURPOSE 1 CU. YD. MACHINE

18½ TON CRANE

1 CU. YD. DRAGLINE

PILE DRIVER

39" BACKHOE

1 CU. YD. SHOVEL

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OFFICES AND WAREHOUSES IN ALL PRINCIPAL CITIES

From 3/4 cu. yd. to 45 cu. yds.

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provide all the advantages of Hendrick Mitco Open Steel Flooring—square-edge, uniformly spaced bars that afford a non-slipping, level walking surface; minimum interference with light because of 90% open area; no obstruction to ventilation; strength and rigidity that insures long service.

A conspicuous, heavy flanged nosing-bar at edge of each tread—a valuable safety feature—also provides reinforcement where load is greatest. Write for Hendrick Mitco Products catalogue.

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MORE WORK PER MAN PER DAY
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New PARCO
INSULATED WATER CARRIER
and Cup Dispenser

Many sanitary features are built into this outstanding cool water dispenser, constructed with stainless steel interior.

Greater labor efficiency is yours by placing this dispenser at a convenient location, or the unit can be carried to men on the job. For additional information and prices, write today.

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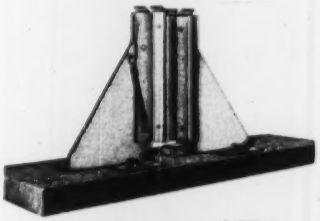
EAST GREENVILLE PENNSYLVANIA

The porous, sintered-bronze filter element, filters all particles of dust, dirt, grit, or scale down to 0.001 in. A series of baffles trap condensation and moisture in a sump pump from which accumulated water can be removed through a drain cock. Filter has a rated capacity of 40 cfm. Filter element is cleanable.—KELLER TOOL CO., GRAND HAVEN, MICH.



Upright Vise for Large Pieces

Heavy doors, windows, plywood sheets, and similar flat, large objects are easily worked upon when held securely by the Drop-Klamp. The edge of any flat object is slipped into the clamp and is held firmly by the weight of the object. A fiberboard liner prevents marring of polished surfaces.—LAKESHORE MFG. CO., 428-P 2ND AVE., SO., MINNEAPOLIS 1, MINN.

New Product Briefs

Speed clip for fastening insulation, asphalt shingles, rolled roofing, and plasterboard to wood surfaces has a broad, flat head which simplifies driving and affords a large surface for maximum holding. Barb on each side of the taper prevents loosening. Speed-Clip (Timberman Products, Inc., Cleveland, Ohio) is produced for insulation 1-in. thick.

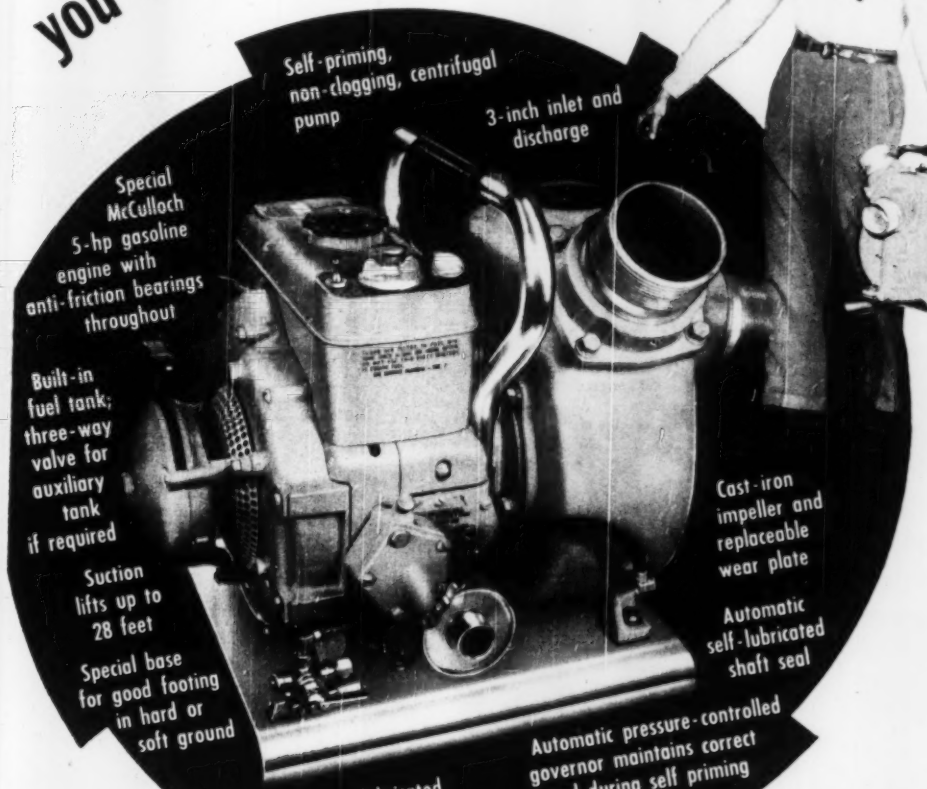
Colorless silicone product has high penetrating properties providing (concrete, masonry, cement blocks, brick, etc.) protection against moisture and water. Invisible Rainchek is produced by Protection Products Mfg. Co., Kalamazoo, Mich.

Solid wood platform (15x20 in.) is designed for hanging from rungs on ladders. Can be used as a step, seat, tool hanger, tool rack, and similar uses. Maker: San Francisco Scaffolding Co., San Francisco 24, Calif.

Puncture proof safety innersole is designed to fit into any conventional work boot or shoe. It consists of a top-grade leather innersole, special spring steel plate, and rubber frictioned cotton duck bonded together under heavy pressure. Maker: Rubber Hide Co., Inc., Trenton 4, N. J.

Here's a 15,000 GPH Pump you can carry in one hand!

Engine and pump together weigh only 57 pounds



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3-inch inlet and discharge

Special McCulloch 5-hp gasoline engine with anti-friction bearings throughout

Built-in fuel tank; three-way valve for auxiliary tank if required

Suction lifts up to 28 feet

Special base for good footing in hard or soft ground

Cast-iron impeller and replaceable wear plate

Automatic self-lubricated shaft seal

Automatic pressure-controlled governor maintains correct speed during self priming and at all loads

Entire unit lubricated automatically by engine fuel

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McCULLOCH MODEL 15M PUMP SEA LEVEL PERFORMANCE TABLE

TOTAL HEAD INCLUDING FRICTION	HEIGHT OF PUMP ABOVE WATER			
	10 Ft.	15 Ft.	20 Ft.	25 Ft.
20 ft.	250 GPM			
25 ft.	245	210 GPM	170 GPM	
30 ft.	235	205	165	130 GPM
40 ft.	215	190	160	125
50 ft.	185	165	145	120
60 ft.	135	130	125	105
70 ft.	65	65	65	60

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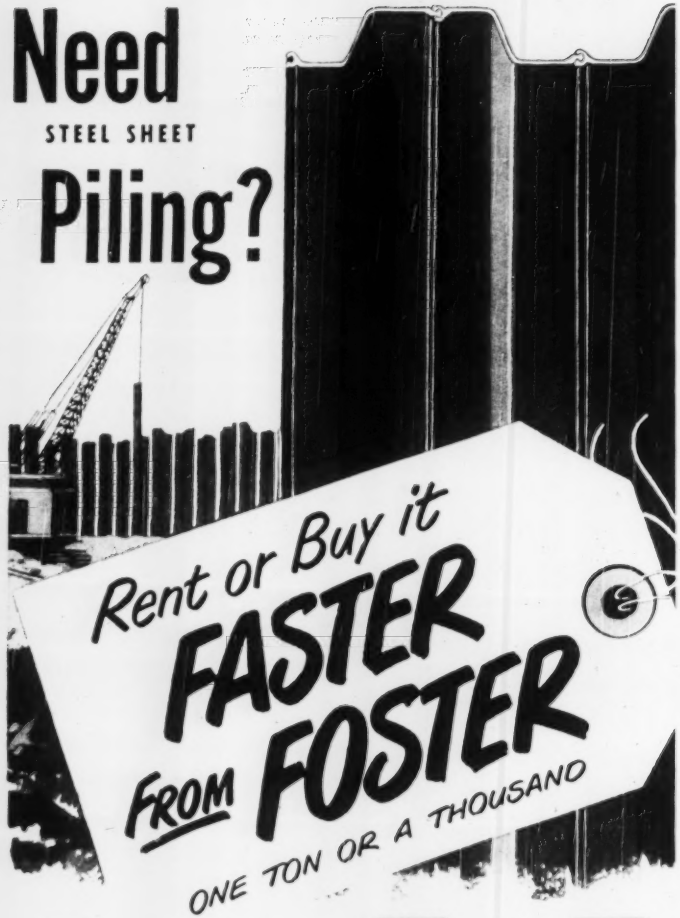

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Manufacturers' Publications

Central-Station Air Conditioners—Low-height air conditioners in capacities from 7,000 to 20,000 cfm are described in 12-p Bulletin No. 6. These central-station units can be floor mounted or suspended from the ceiling. The bulletin describes features of various units in the line and contains complete specifications for each.—BUENSOD-STACEY, INC., 60 E. 42ND ST., NEW YORK 17, N. Y.

Plastic Cement—Detailed recommendations for mixing and application of Calaveras plastic cement are listed in this pocket-size pamphlet. Six advantages listed are: Greater sand-carrying capacity, unequalled plasticity, accurate control, greater mortar strength, resistance to shrinkage cracks, and unmatched durability.—CALAVERAS CEMENT CO., 515 MONTGOMERY ST., SAN FRANCISCO 4, CALIF.

Rubber Conveyor Belting—Installation, care, and maintenance of rubber conveyor belting are described in this pamphlet. Subjects covered include splicing, cold-patch and heat-vulcanized minor repairs, all types of major repairs, and other important phases of conveyor repairs.—CARLYLE RUBBER CO., INC., 64 PARK PLACE, NEW YORK 7, N. Y.

Abrasion-Resistant Alloy—The uses and advantages of Thermalloy HC-250 are listed in 6-p folder. Feature of the folder is a description of the physical properties of this abrasion-resistant material. Several case histories describing the metal in actual field service are another feature of Bulletin F-176. The bulletin also contains information on the microstructure of HC-250, how it is supplied, facts on distortion, its machinability, and cost per operating hour.—AMERICAN BRAKE SHOE CO., ELECTRO-ALLOYS DIVISION, 230 PARK AVE., NEW YORK 17, N. Y.

Linear Conversion Table—Reference table lists conversion of inches and fractions into decimal parts of a foot. Known as HDC-110, the table is arranged on a single card and is available free.—THE BABCOCK & WILCOX TUBE CO., BEAVER FALLS, PA.

Clarifiers, Sludge Collectors—Circular collectors for clarification (sedimentation) and sludge collection are des-

(Continued on page 130)

Quaker State stabilized Quadrolube is especially made for transmissions and rear axles, except hypoids. It is exceptionally resistant to pressure and heat.*

QUAKER STATE QUADROLUBE embodies all the unparalleled qualities of 100% pure Pennsylvania base oil. It resists not only pressure and heat to a remarkable degree, but it also resists cold, moisture, rust, corrosion and foaming.

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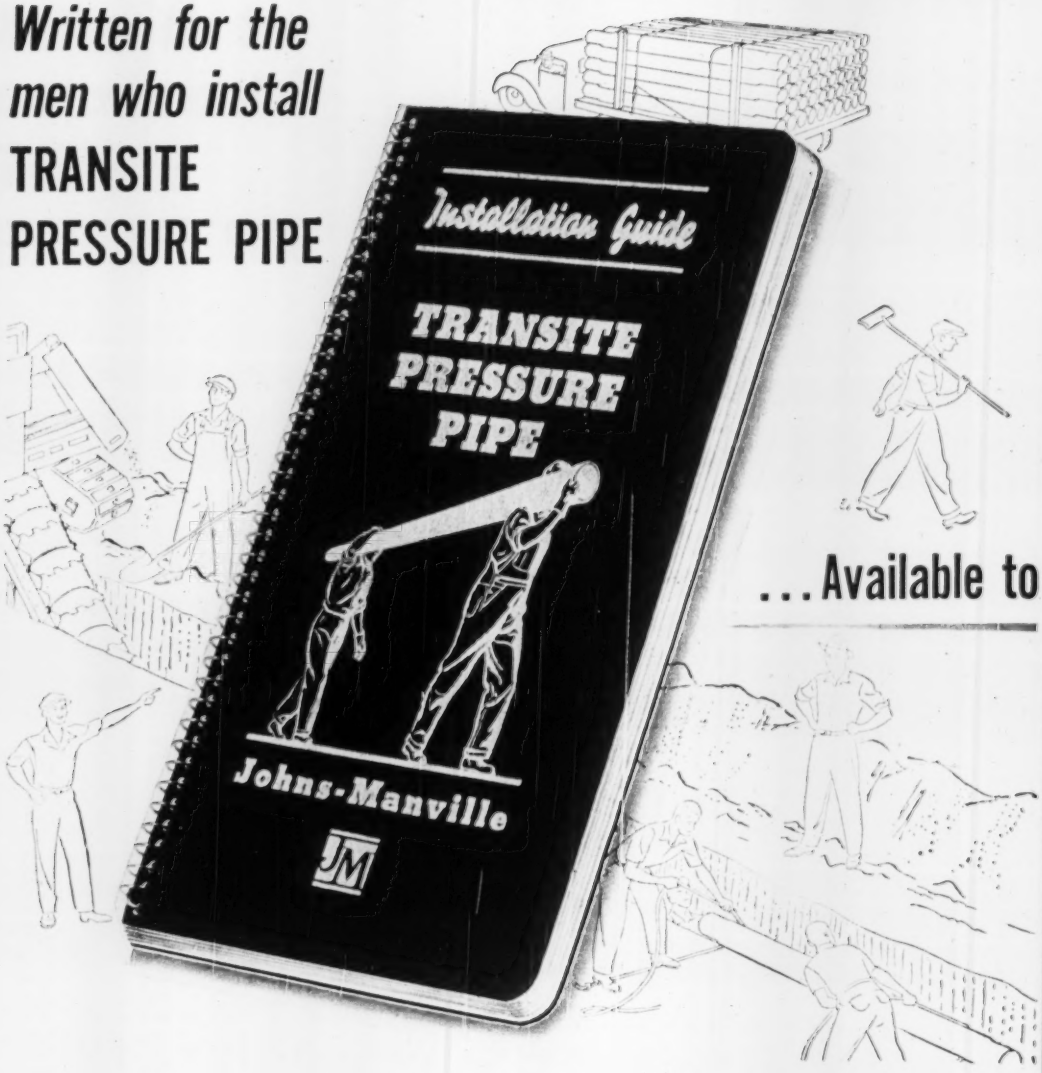

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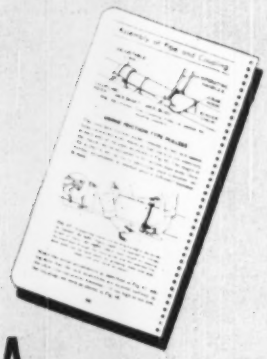
Q. *How is Transite Pipe assembled in the trench?*



A. By means of the Simplex Coupling, a factory-made joint. See page 38.

Q. *How are joints checked for correct assembly in advance of leakage tests?*

A. By the use of a simple feeler gage as described on page 50.

Q. *Are standard practices used for making joints at fittings?*

A. Yes—see "Making Joints at Fittings" page 78.

anyone who wants the answers to questions like these

Q. *Can you cut, machine and tap Transite Pipe in the field?*

A. Yes—see "Cutting Transite Pipe" page 72 and "Service Connections" page 91.

Q. *How are size and type of thrust blocks at fittings determined?*

A. The Guide gives helpful data, including tables, construction, and location. See page 82.

Q. *What about trench preparation, supporting the pipe, and tamping?*

A. Standard methods are employed. See pages 16, 23 and 97

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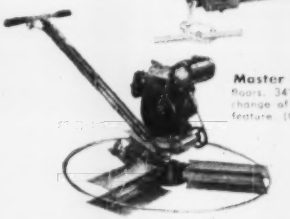

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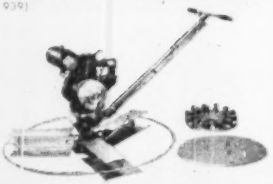

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Floats concrete and asphalt mastic floors with a high-speed 24" disc. Grinds floors with 16" or 22" disc. Easily converted to Turn-A-Trowel by substituting trowels for disc. (Cat. No. 939)

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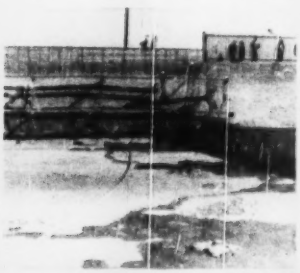

In 1947 we "GUNITED" the West End Reservoir at Hagerstown, Maryland. The pictures clearly show important stages in our work to give it greater capacity and to stop excessive leakage. After existing cracks in the concrete floor were sealed, "GUNITE" was applied to waterproof and reinforce the stone masonry and to add 30 inches to the height of the walls.

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cribed in a revised 16-p bulletin. Bulletin 4906 provides complete engineering data and specifications and comprehensive capacity tables for three types of collectors. One page is devoted exclusively to latest data on the Carter plunger sludge pumps for removal of settled sludge from hoppers of the circular collectors.—RALPH B. CARTER CO., 192 ATLANTIC ST., HACKENSACK, N. J.

Diesel Engines—Bulletin 5291 contains complete specifications for all automotive and industrial models of the HR-400 Cummins diesels. These engines develop 100 hp at 1,800 rpm and are available in six models for all types of highway and off-highway automotive applications. Bulletin 5296 contains specifications for the HRBB-600 and HRBBI-600 diesels. These engines develop 175 hp at 2,000 rpm and are designed for automotive applications where there is a need for high rotative speeds and high horsepower.—CUMMINS ENGINE CO., INC., COLUMBUS, IND.

Protective Coatings—Corrosion-proofing compound for metal, concrete, and wood surfaces is described in 14-p bulletin. Bisonite M is resistant and non-contaminating to acids, salts, and alkalis. BiChem R is a heat-resistant aluminum paint that dries to the touch in 12 to 15 min. This paint is fully described in a 1-p data sheet.—BISONITE CO., INC., 128 LAKEVIEW AVE., BUFFALO 1, N.Y.

Arc-Welder Catalog—Complete line of Arco arc-welding machines are described in a 36-p illustrated catalog. It is divided into two parts, the first dealing with ac units, the second with dc. Descriptive text lists distinctive features, operating data, specifications, and other pertinent information. This is the fourth catalog in a projected series of ten.—AIR REDUCTION SALES CO., 60 E. 42ND ST., NEW YORK 17, N.Y.

Aluminum Paint—Best uses of aluminum paint are described in a comprehensive, 32-p brochure. Profusely illustrated, the book uses 50 photographs to show proved applications of aluminum paints on (1) Metal, concrete, masonry, and similar surfaces; (2) for weather-exposed wood; and (3) for interior heated surfaces and for decorative uses.—ALUMINUM CO. OF AMERICA, 661 GULF BLDG., PITTSBURGH 19, PA.

Insulation Hardboard—Comprehensive technical manual (20 pp) contains detailed information on use of Rabi-

(Continued on page 133)

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TIMKEN® makes all three rock bit types—multi-use, carbide insert, and one-use. And to help you select the one best bit for *your* job, Timken offers the services of the world's largest field engineering organization devoted exclusively to rock bit problems. With all three types of rock bits to draw upon, the Timken Rock Bit Engineering Service can help you get the bit performance you're after—whether it be lowest bit cost, lowest cost per foot, greatest possible drilling speed or other desired advantages.

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tex R-105-S insulation hardboard for low-temperature insulation. Bulletin describes construction of this material—an expanded-rubber compound, made of synthetic stocks. It will not absorb moisture and may be used without an added vapor barrier. K factor is 0.21.—GREAT AMERICAN INDUSTRIES, INC., RUBATEX DIVISION, BEDFORD, VA.

Building-Moving Facilities—History and facilities of a company concerned with moving any and all types of structures is reviewed in a catalog entitled, Moving With the E. W. LaPlante Co. Feature of the catalog is a description of several typical projects involving the moving of large buildings, houses, city blocks, and water towers.—E. W. LAPLANTE CO., 2325 E. 46TH ST., INDIANAPOLIS, IND.

Hydraulic Cylinders—New Ledeen catalogs are available describing the use and construction of pneumatic and hydraulic-actuating cylinders. Bulletin CS-248 describes the use of these cylinders for removal of mold cores from fresh concrete pipe during production; Bulletin 500 lists dimensions and weights, ratings, and limitations of the Ledeen medium, heavy, and super-duty lines.—LEDEEN MFG. CO., 1600 S. SAN PEDRO ST., LOS ANGELES 15, CALIF.

Suspended Acoustical Ceilings—Brochure (8 pp.) describes AcoustiLine system of suspended acoustical ceiling construction. Drawings in the catalog show various parts of the system and how they clip together. Photographs of actual installations show how the ceiling is adapted to various types of lighting fixtures.—THE CELOTEX CORP., 120 S. LASALLE ST., CHICAGO 3, ILL.

Six-Wheelers—Tandem-drive units for all types of 6-wheelers are described in a broadside prepared by Timken-Detroit. The bulletin lists the types of 6-wheelers, and types and design features of Timken-Detroit tandem-drive units. The bulletin is replete with photographs and drawings used to illustrate the text matter.—TIMKEN-DETROIT AXLE CO., 100 CLARK, DETROIT 32, MICH.

Portable Power Tools—New Ehor catalogs include: Circular H-1148 on Ehor Copper-Line tools including ¾- and 1-in. drills; Circular H-1139 on the Model 35 sinker rock drill; and Circular H-1152 on four mining tools including a new sinker leg, an air bar feed, a pneumatic column, and a stoper leg.—INDEPENDENT PNEUMATIC TOOL CO., 175 STATE ST., AURORA, ILL.

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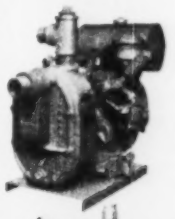

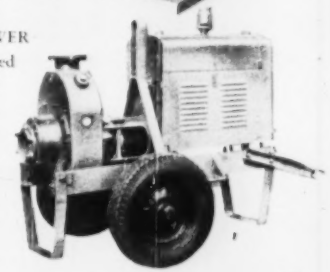

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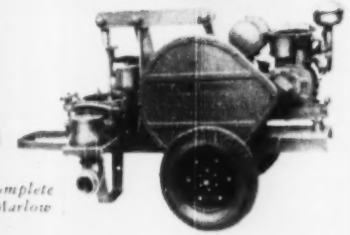

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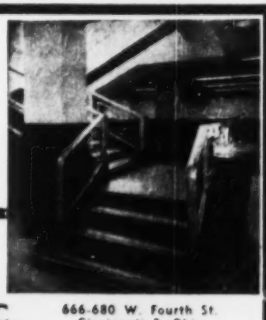

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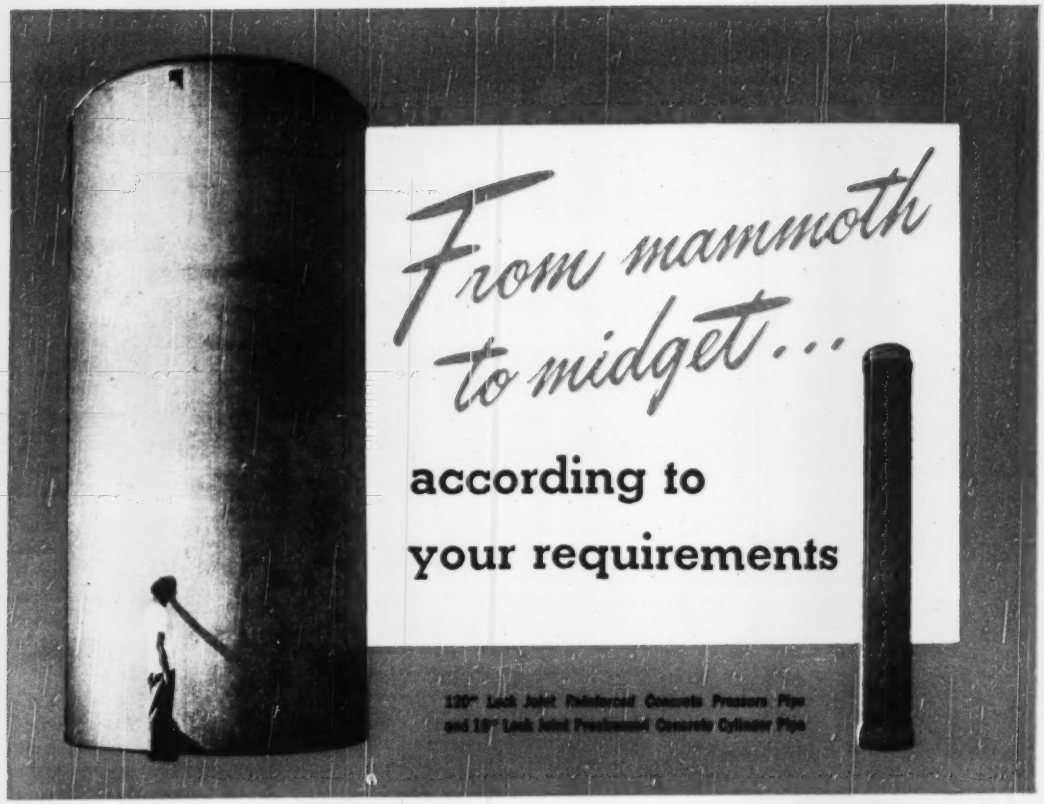
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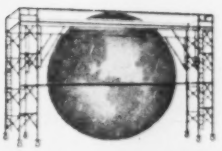

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Letter from . . .

NORTH CAROLINA

North Carolina's $200 million experiment in putting an all-weather surface on every rural road in the state already looks as though it might pay out. Involving upwards of 50,000 miles it's no test tube trial.

Gov. W. Kerr Scott and his associates promoted the program primarily on two counts: A year round road to market for practically every farm and routes the rural school buses could travel without interruption.

Only about 5 percent of the $200 million has been spent since work began last September. From this limited experience, backed by years of previous experience, it's evident that Governor Scott's ideas on farm-to-market and school bus roads are sound.

But two other developments are resulting that are of at least as great importance. Financially, they are far more so.

One of these is a market for land along the newly improved roads for which formerly there was almost no demand.

The other is that the all-weather rural roads tap great reservoirs of labor for North Carolina's industries.

Should these two unforeseen developments continue, as expenditures increase, then the state apparently will find the 50,000-mile experiment a most profitable investment.

With a population of about 4,000,000, North Carolina is basically a rural state. Charlotte, its largest city, has only about 150,000 people. North Carolina's industries, largely in the western half of the state, are mainly in small cities and towns. Their employees live in the country to an extent unknown in the snow states. Many drive 15 to 20 miles into town.

Rural homes of these industrial employees are largely along the primary highways, usually on small farms high in acreage value. They have stuck to the primary highways to be sure they could get to work. Now they are beginning to spill over onto the well improved rural roads, where land values have been much lower.

Highways are a tool—North Carolina earned a reputation for taking big chances on highway investment when it tackled its first primary program back in 1920. Although the state then was quite poor, a $50 million bond issue for highway construction was voted. Ultimately, $115 million in bonds were sold.

These seemed staggering figures for a state with little wealth. Since then, North Carolina has shown great progress, due at least in part to its courageous venture into highways. Now, the $200 million experiment on rural roads is, in proportion, much less of a burden. In fact, the only increased cost to it's people is a raise from 6 to 7 cents in the state's tax on gasoline.

State handling of rural roads also is not new in North Carolina. Back in 1931, the state took over the construction and maintenance of all rural roads. Since then, the state has been entirely responsible for all roads.

Up from the dirt—Under this setup, North Carolina had done quite a bit of all-weather surfacing on rural roads. But many thousands of school buses routes were impassable at times. Other thousands of rural roads are just plain dirt.

North Carolina transports a very large percentage of its rural children to consolidated schools. There are practically no single-teacher schools left in the state. Very few have less than twenty teachers. Some rural counties are building a single central high school.

These conditions were the main basis for Governor Scott's rural road program. Opposition from the cities and towns was strong. But the Governor is a dairy farmer, who was for 12 years commissioner of the state's department of agriculture. He knew that about 75 percent of the state's population lives in towns of less than 2,500 people and in the country. His campaign resulted in a big victory for the $200 million issue.

Conditions vary—In putting an all-weather surface on these roads, a wide variety of conditions must be met. The state's eastern third is a flat coastal plain. Great areas are little above sea level. The western third has the highest mountains east of the Mississippi. Differing soils, climate and other controlling factors call for different plans and methods.

Experience since 1931 gave the engineers of the State Highway Commission the know-how. The vast new program is merely an expansion of operations.

An unusually open winter followed the start of the program. Work kept going with little interruption. With spring, the commission was set to improve much more mileage this year than seemed possible a year ago.

Most of the work is in bits and pieces, practically all of it single line. Such projects are handled largely by force account, directed by commission engineers.

Saving on paving—Some 12,000 miles of the state's rural roads carry enough traffic that the program provides they may be paved. In most cases, a 16-foot width, particularly in the mountains. There, an average of twice the mileage may be paved to that width, due to the heavy cost of widening to 16 feet.

Wherever practical, the paving is being done under contract. Crushed stone and crushed gravel also are bought directly from private producers.

Between 1937-38 and 1947, traffic on rural roads in North Carolina increased an average of 70 percent. The belief is that the next decade's rate of increase will be much higher.

One main criticism of the $200 million experiment has been that it would lead to neglect of the primary system. But the commission shows figures that:

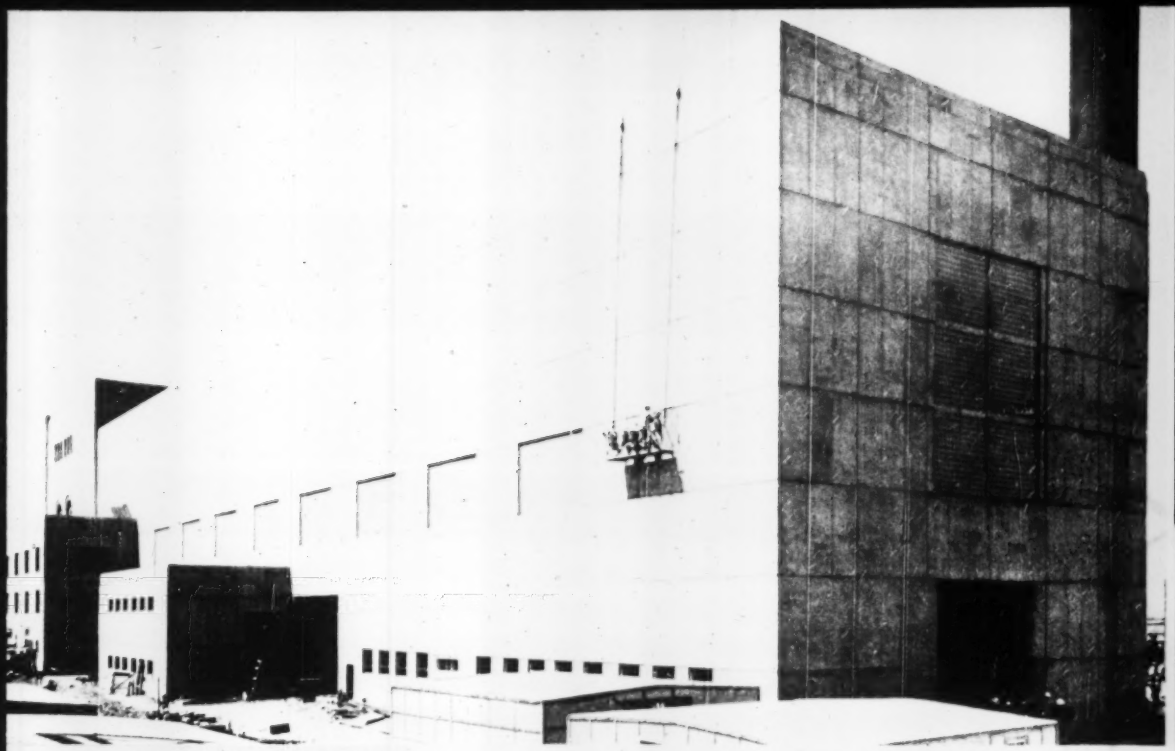
1. Prove the income from the state's gas tax will be sufficient to service the big bond issue; and

2. Leave ample funds to continue to improve and maintain the primary system at least as effectively as in the years since the war.

These figures are based on current traffic.

North Carolina recently found a quick sale for two issues of bonds out of the $200 million the voters authorized. The first issue, of $50 million went at 1.57 percent interest. A second $75 million did even better at 1.52 percent.

These interest rates are a little more than one-quarter the average interest the state paid for the $115 million issued to do the first financing of its primary system. Incidentally, the last of these earlier highway bonds will be retired in about three years.



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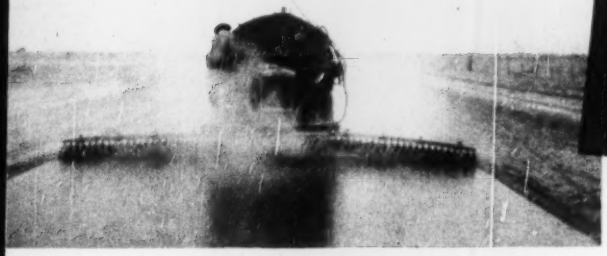
CLEVELAND 3, OHIO TORONTO, ONTARIO

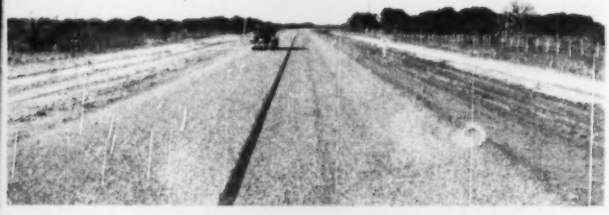
Road-building with Texaco in aggregate-poor areas

Laying 4 inches of Texaco Asphaltic Concrete paving, containing low-cost local aggregate, on State Highway 29 in Texas.



Applying a hot seal coat of 175-penetration Texaco Asphalt to the asphaltic concrete surface.

Crushed gravel, heated to 375° F. is spread and rolled into the asphaltic seal coat.



Completed Texaco Asphalt pavement on 12 miles of Texas Route 29, constructed by J. M. Dellinger, Inc. of Corpus Christi.

Along the Gulf Coast of Texas, the only local aggregate for highways is caliche, a relatively soft material, and sand. How these low-cost materials were used to construct 12 miles of state highway will interest road builders in other aggregate-poor areas.

For a subbase, caliche was laid to a compacted thickness of 7 inches. Over this was constructed 4 inches of Texaco Asphaltic Concrete—caliche and sand plant-mixed with a 90-penetration asphalt. To compensate for the soft caliche, a seal coat of 175-penetration Texaco Asphalt was applied and covered with heated, crushed gravel, the only imported aggregate used.

The caliche subbase was primed with Texaco MC-1 Cutback Asphalt. Tack coats of Texaco RC-2 Cutback Asphalt were applied between the three or four layers of asphaltic concrete.

Whatever your own road, street or airport paving problem, you will find an effective, economical solution in Texaco's complete range of Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils. Refined from selected crudes, Texaco Asphalt products have helped construct and maintain America's highways for 45 years.

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